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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO.,
Patent Solicitors.

SAN FRANCISCO, SATURDAY, JANUARY 4, 1876.

VOLUME XXVII
Number 1.

Safety Apparatus, by A. and L. Denayrouze.*

At the beginning of February, 1873, there were made in the catacombs of Paris experiments with a safety apparatus which the inventors named Aerophore. There were present when the experiments were made about fifty persons, among whom were the Inspector General and the President of the General Council of Mines, Mr. Gruener.

In a roomy place provided with benches for the spectators was a cabinet, of which the wall turned towards the spectators had several panes of glass, and the opposite wall had a door provided with a lock. Inside the cabinet were four rows of burning candles, one above the other, and after a couple of chickens and a rabbit in cages had been placed in the cabinet, a man entered through the door, which he locked behind him, with a safety apparatus on his back and a burning lamp in his hand. The apparatus was connected by means of a hose with a compressing air pump. Outside was an apparatus containing carbonic acid gas. This gas was let into the cabinet through a hose; the flow of gas could be distinctly perceived. Soon the lowest row of lights went out, then the second, then the third, and at last the uppermost, hot the workingman with the apparatus on his back continued his work uninterruptedly, the carbonic acid gas notwithstanding, and his lamp kept burning on the level of the already extinguished candles with a bright, steady flame. In the meantime the gas rose to the cages. The chickens died quickly, and the rabbit, placing itself instinctively on its hind legs and holding its nose as high as possible, fell dead to the ground after a few ineffectual leaps. The man continued digging and the lamp kept burning with the same brilliancy. At the close of the experiment the inventors were congratulated by all present, especially by Mr. Gruener.

The reporter of the *Courrier de France*, from whose number of February 4th, 1873, the above description has been taken, regrets that this invention had not until now found that introduction and application which its usefulness deserves. He proposes to invite all owners and managers of mines to these experiments, and thinks that, when they had seen the leaps of the rabbit caused by the pangs of death, they would procure this apparatus immediately, and not, as has been the case until now, buy one after an accident has happened.

As early as 1853 the Academy of Science in Brussels, in the course of its regular business transactions, invited the scientists to make earnest exertions for the discovery of a practical method which would enable the miner with convenience and safety: 1. To penetrate great distances without interruption. 2. To remain. 3. To illuminate, and, 4. To work without restraint in places filled with noxious gases.

About ten years ago Mr. Rouquayrol, mining engineer in Firmy, placed before the mining company in St. Etienne for examination an apparatus to be used in places filled with foal air, for which he received a silver medal.

After there had been made different practical tests, especially in diving with Rouquayrol's apparatus, the brothers Denayrouze again took up the question, and believe that they now have constructed an apparatus which answers perfectly the above requirements.

The principle of the Rouquayrol's and Denayrouze's apparatus consists in making the respiration of the workmen and the burning of the lamps independent of the surrounding air, of whatever nature the same may be. When the distance of the locality worked from a place containing fresh air is not great, only an apparatus of low air pressure is required; but where the air must be obtained from a great distance or from the outside of the mine, or where a large number of workmen are to be supplied, an apparatus with strongly compressed air must be supplied.

The Apparatus with Low Pressure.

It consists of an air compressing pump, of the

epurateur, a contrivance for the purification of air, of an air conducting hose, of the regulator and the lamp. The pump is described in the *Zeitschrift fuer Berg, Huellen und Salinenwesen in dem preussischen Staate*, and here it may be stated, that it supplies with ease air enough for respiration and illumination for two men. A more detailed description is given here of the two new parts, the regulator and the lamp. The epurateur is an improvement of the respiration apparatus.

The function of the regulator *Rr*, in the accompanying engraving, is to supply the workingmen and the lamp with air in proportion to requirements. Its weight never reaches four kilo-

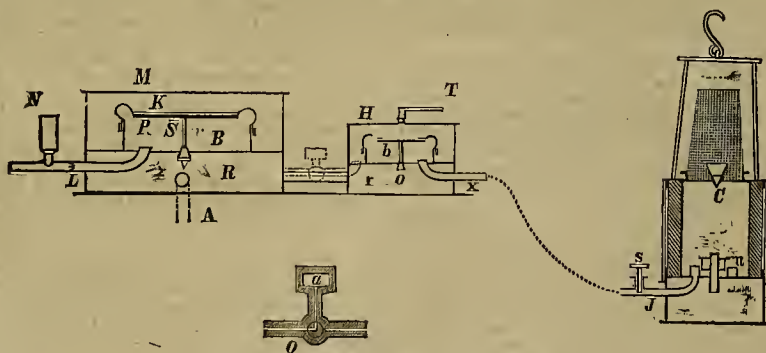
with a mouth-piece of caoutchouc, which exactly fits the mouth and is held between the lips and the teeth. The nose is closed by a clamp which prevents the entrance of the surrounding air. In places filled with smoke a smoke cap with spectacles is used. The breathing hose lies on the shoulder of the miner. To protect it against external injuries, the regulator is placed in a tin box, provided with holes. As soon as compressed air flows into *R* the valve closes tightly, while the tension of the surrounding air acts in the chamber and upon the cover *K*. If now the miner inhales through the hose *L*, a part of the air of the chamber *B*, the tension in *B* is reduced, the outside air



SECOND CANON OF THE YELLOWSTONE.

grammes. The lamp has form and weight of a common safety lamp, but differs from it in the important point, that it does not burn at the expense of the surrounding air, but that it draws its supply from air, free of noxious gas. The regulator consists of a reservoir *R*, into which the air passes by means of a rubber hose screwed to the reservoir. The pressure of air in *R*

presses upon the cover *K* and this causes it to sink, together with the shaft *S*, and thus the valve is opened. The air in the reservoir passes through the opening of the valve into the air chamber *B*, and through the hose to the lungs of the laborers. At the cessation of inhalation the upward pressure in *R* closes the valve and the communication between *R* and *B* is inter-



SAFETY APPARATUS FOR MINERS.

depends on the number of knob lifts (*Kolben-luebe*), and therefore may be regulated. From *R* the air is distributed for respiration and illumination. Over the reservoir is placed a cylindrical air chamber with an open top, but covered with a caoutchouc cap. This cap is fastened to the side wall with an elastic band to establish a perfect closing of the air chamber. By means of a metal shaft *S*, the caoutchouc cap is fastened to a metal plate *P*, which has a smaller diameter than the air chamber. In the wall, between the reservoir *R* and the air chamber *B*, is a conical valve *O*, opening downwards and placed in an opening of several millimeters diameter, by means of which the communication between *R* and *B* is established. From the air chamber *B*, leads a rubber hose to the mouth of the laborer. The end of this hose is provided

ruptured during exhalation. The exhaled air partly returns through the hose to the air chamber *B*, but the greater portion escapes through a caoutchouc valve *N*, composed of two pieces of caoutchouc, and so connected and constructed as to be closed by inhalation and open by exhalation.

The conveyance of the air to the lamp takes place in the following manner: There is connected with the reservoir *R* a smaller one, *r*, over which there is an air chamber, but of smaller dimensions, for the requisite of air for the supply of the lamp is less than the quantity needed by the man for respiration. The construction of the air chamber *b* is in all respects like that of *B*, with but one exception: there is placed over it a cylindrical cover, *H*, to prevent the access of external air. The com-

munication of the reservoir *R*, with the space between the air chamber *b* and the cover *H*, is effected by means of a cock, *R*, turning both ways and bearing on its upper end a hollow nut, *a*. In the position of the cock in the drawing the reservoir *R* communicates with the nut *a*, and the communication of said reservoir with the space under the cover *H* is intercepted. In this manner too much air cannot pass into the space under the cover *H* from *R*. With every turn of the cock a sufficient quantity of air is admitted into the nut; hence, from the number of revolutions of the cock the quantity of air under the cover may be calculated. Moreover, the dimensions are so chosen that a single revolution admits a sufficient quantity of air. The screw *T*, in the middle of the cover, serves the purpose of increasing or decreasing the pressure of the air, besides leading away the compressed air and regulating the supply of air for the lamp. A hose, *X*, leads from the small air chamber, *b*, to the lamp. When a part of the air coming from *b* is burned, and the quantity of the air, and with it the pressure in *b*, is decreased, the compressed air enclosed under the cover, *H*, presses downwards the caoutchouc cap, together with the metal plate and shaft, the valve opens and air flows from *R* into *b*, and thence through the hose to the lamp. In this manner the lamp receives its uninterrupted supply of air.

Scenery on the Yellowstone.

The second canon of the Yellowstone is described by Prof. Hayden as being carved out of a lofty range of mountains by the river. A sketch taken in this canon is shown on this page. The canon was undoubtedly started in a fissure, but is mostly one of erosion.

It is about three miles long. This is, of course, an extension of the range of mountains in which Emigrant gulch is located, and it undoubtedly contains mines of gold. The rocks, with their peculiarly distinct and contorted strata, as well as texture, remind one of the gneissic mountains in the mining districts of Colorado. The river rushes with considerable force over the loose masses of rock that have fallen into the channel, and presents a picturesque view to the traveler struggling along over the narrow trail, high up on the mountain side. But wherever the water forms an eddy, so that it is even moderately quiet, the number of fine, large trout that can be taken out within a limited period, would astonish the most experienced fisherman. Above the canon the rocks return at once to their igneous character. This is readily shown by the difference in the appearance of the surface features. Although the granitic portion is higher and more massive in its general aspect, yet the surface is rounded and much of it covered with debris that admit the growth of grass, while the volcanic rocks give a jagged ruggedness to the outline. Outflows of dark brown basalt, apparently of late date, mingled with huge masses of breccia, can be seen on either side of the valley to the summits of the mountains. The foot-hills on either side are certainly composed of breccia for several miles, which, decomposing, gives to the surface the appearance of the remains of an old furnace. Perhaps it would be better to compare it to a modern volcanic district.

SOUTH MOUNTAIN.—The Idaho *Avalanche* says: South mountain to-day is a "busted" burg, financially; business is almost entirely suspended. The streets are no more lively than the streets of ancient Thebes. Not four months since there were a thousand men in and around this camp, heavy freight teams were seen on our streets every day, business was good, prospects were encouraging, and everybody making money. But to-day not more than sixty men remain to tell the tale of by-gone days. The streets are deserted, the musical voice of the bull-whacker is among the things that were. Only an occasional hummer ventures out and wends his way to the nearest gin-shop to sponge a drink, and rarely gets it. Notwithstanding the gloomy outlook the people, what there is left of them, have not given up all hopes that the camp will be all right again in the spring.

SETH McCAIN, one of the pioneers of Nevada died on Tuesday.

*Translated for the PRESS from *Oesterreichische Zeitschrift fuer Berg-und Huellenwesen*.

CORRESPONDENCE.

Krom vs. Rittinger.

MESSES. EDITORS:—Pending the publication of my description of the concentration works at Falun, there appeared in your paper a well written article on concentration, by Mr. Samuel Purnell, which evinced the possession of correct knowledge and views in the art on the part of the writer—as regards the general principles involved, at least.

As Mr. Purnell undertakes, however, to champion the claims of the Krom dry concentrating jigger, and the system of dry concentration in general, in opposition to the system of wet concentration as developed by Rittinger, and the apparatus therein used, I venture to object to some of the arguments used to defend his position, as tending to prejudice the less informed readers of your paper against a method of ore dressing, the inferiority of which, as compared with dry concentration, must be proven by more than the opinions of a few persons who cannot claim any very extensive experience in either method of ore dressing—for want of opportunity to attain it—or by half stated results of a few, to all appearances imperfect experiments.

One of the arguments used to prove the inefficiency of the Rittinger system was, that works having been built on that system at a cost of \$300,000 had proven a failure.

Now, the very circumstance of parties expending such a sum of money in the erection of works, without first assuring themselves by careful preliminary experiments on a limited scale, of the capabilities of the system to be adopted, is proof sufficient that those parties did not understand their business, and leads to the inference that there were other causes of failure than the choice of an unsuitable process merely. As well might the argument stand, as used in Colorado, that, because rudely constructed Rittinger percussion tables did not give satisfactory results, that kind of machine was not suitable for the treatment of the peculiar class of ore.

Those who have witnessed the operation of dozens of these machines in the extensive concentrating establishments of Europe, on a great variety of the ores of lead, copper, silver, gold, zinc, cobalt and nickel, tin, iron, and the separation of stone coal from slate, with uniform success, and who have further proof of their efficiency, in the reliable and detailed statements of results obtained during months and years of regular work, establishing the capabilities of the machines beyond a doubt, will not be convinced by such arguments as those cited, but will demand proof resting on as sound a basis as their information to the contrary.

Granting, in part at least, the theoretical premises claimed as favoring the use of air in place of water, it may still be asked, what becomes of that part of the valuable mineral, which, after the crushing between the rollers, is still found enclosed, in a gradation of quantity, in the various classes of coarse and fine sands, and which can only be made available to concentration by a finer pulverization of the particles of ore.

It is a well established fact, that rollers will not crush fine for any length of time, and that the bulk of the product from their action is in the form of coarse sand. Still, there seems to be no provision of other machinery for this further pulverization in the Krom system, as illustrated by Mr. Purnell.

To claim that this was found unnecessary because the coarse jiggling wastes were found to be sufficiently impoverished, would merely indicate that Mr. Krom, in such instance, was under obligations to a rare freak of nature, favoring the results from his system. With the majority of ores it would be found as elsewhere, that only a part of the jiggling wastes would be sufficiently impoverished to be passed off, while a considerable amount of intermediate products would result, too poor for admixture with the concentrates, and too rich to be run into the waste sluice; their further utilization makes their further disintegration an imperative necessity. To assert that rollers are suitable for this work, would be a silly taunt in the face of experience. Rollers are also uneconomical for fine crushing, in consumption of power and wear.

It is further argued, that the lesser density of the air facilitates the separation in the jiggling operation. This is true in the jiggling of the coarse classes, which are sized in the wet method also; in the fine grades it is different, the separation depending on the action of inertia of particles of varying size and density, in rapidly ascending and descending currents of water, during short periods of time, in which the density of the water favors the separation. When this can be contradicted, with proof as convincing as is given for the law by Rittinger, then we will be ready to heed the arguments. It will also be remembered, that this law is not a theoretical assumption merely, but has been proven practically correct, by the improved results obtained of late years with the rapidly working fine sand jiggers, arranged to act in accordance with the above mentioned law. The

results obtained with jiggers making 200 and more strokes per minute, are also a practical refutation of the assertion made by Mr. Purnell, in regard to the admissible number of strokes in the water jigs.

It is also urged, that the greater number of strokes in the air jiggers gives them a superior capacity. This favors the separation; but this working capacity in the water jig does not depend on this alone—the working off of this waste sands has equal or more influence on the capacity and will certainly be effected most rapidly by the denser medium, the current of water, with its greater force of impact.

That the separating action in the water jigger is ample, is proven by the products obtained in a machine with only two compartments. The product from the second compartment is found so poor as to require re-working, showing that the bulk of the mineral to be separated has gone down in the first compartment. The presence of ore particles in the second compartment cannot be ascribed to imperfect separation altogether, but is mainly due to the unavoidable differences in the size and density of the particles under treatment, differences which cannot be avoided within the practicable limits of sizing and grading, and which will assert themselves in any system of concentration, and deteriorate the results obtainable with any machine.

Even if the Krom jigger were to be proven a machine capable of separating these intermediate products with the richer concentrates, in consequence of the lesser difference of density required for separation in the less dense medium air, this would not in all cases satisfy the requirements, because the admixture of the middlings would often make the products too poor for the attainment of the greatest profit. In the wet concentration these middlings are subjected to a further pulverization, and the valuable mineral thereby liberated from the rock, extracted with further appliances found most suitable.

Moreover, I have not seen any well authenticated statement of guaranteed results, giving the working capacity of the air jig in the form of figures. The wet jiggers of the newer construction will concentrate from four to fifteen tons of sand and gravel per day, according to the size of grain and the mineral to be separated. What can be guaranteed to be the capacity of the Krom jigger on the different sizes of grain to the working of which it has been found adapted; and what is the finest class or size it will work?

It is also intimated that the Krom jigger can be put up for a less price than water jiggers of the same capacity—the cost of the former being given at \$500. To this I will reply, that when I have finished my present work of fitting up the machinery department of the Boca Lager beer brewery, I will be prepared to furnish water jiggers, possessing the merits of the most approved machines, for \$500, and will guarantee them to do more work than a Krom jigger on the same grade of ore will do, with an equally satisfactory separation.

True, the water jigger finds its limit of excellence in the decreasing size of the particles, and in the case of particles sifted through screens finer than thirty to forty meshes to the linear inch, it is superseded by other appliances of greater efficiency. To what extent the Krom jigger can compete with these, I have no information definite and reliable enough to make a comparison. Granting that the air jigger can equal these even in the treatment of the finest grades—for which there is no sufficient proof—the dry system has still to cope with the difficulties of dry sifting through fine screens, a slow and imperfect operation, when compared with the rapid and efficient system of grading with the aid of ascending currents of water, especially when considered in connection with the economical advantages of wet stamping in batteries with a dammed water discharge.

One of the chief advantages of the dry system seems to be the saving of the finest particles, which being thrown into spacious dust chambers, will certainly deposit from air much more rapidly and perfectly than they would in water. Still, even this advantage applies to a limited class of ores only with such force as to outweigh the economical advantages of wet concentration.

With a judicious system of gradnel fracture, the proper use of the "Stausatz" battery, and well arranged slime tanks of sufficient capacity, the loss through floating away of the finest particles, in the case of any ores except those containing the very frangible silver minerals, can be reduced to a trifling amount. The loss caused by insufficient liberation (by pulverization) of the mineral to be saved, will in most cases far exceed the loss by float. Certainly, if Mr. Purnell takes the loss by the wet system, by the reported results obtained ten to fifteen years ago, with the arrangements then in use, the showing will be less favorable.

As an isolated example of the performance of the dry system with the Krom machine, etc., Mr. Purnell mentions the results obtained in Star district, Nevada, where, it is claimed, ninety-five per cent. was saved in the concentration of a silver ore. Unless a more satisfactory statement can be made of the work there done, than is contained in the Report of the U. S. Commissioner of Mining Statistics, I beg to submit that the test is not very convincing. The values obtained, as there reported, when summed up, lead to the inference that the ore must have become richer in the course of treatment, or else the determination of weights and values be far from accurate, or the saving of rich fine dust—the principal ad-

vantage of the system—must have been insignificant comparatively. So, at least, it must appear to the impartial, calculating reader, until a more satisfactory statement is given.

I do not wish to detract from the real merits of the new system, and the Krom machine, for I am assured by good authority that it does good work, and cannot but admit its great value in numerous districts in this country, where the scarcity of water makes wet concentration difficult or even impossible. When, however, the disciples of the Rittinger system are requested to renounce the predilections attained by experience and observation, in such works as those of the Harz, Altenberg, Stolberg, Ems, Pozibram, Falun, and many others, in the treatment of almost every variety of ore, then it may not be considered presumptuous, if they demand more positive, accurate, detailed and repeated proof of the superior efficiency of a new system, than has hitherto been presented, regarding the results obtained with the dry system by the aid of the Krom jiggers, etc.

When such proof is given that the problems of an art assiduously studied for centuries, and always considered difficult, have found a solution at once so simple and efficient, then none will be more ready and willing to welcome and proclaim it a benefaction to mankind, than those who have a thorough appreciation of the shortcomings of the wet system of concentration.

CHARLES C. RUEGGE.
Boca, December 21st, 1875.

The Kossuth Mine and Machinery.

The Lyon County Times says of the mine and its machinery: The building which covers the hoisting machinery is strongly and plainly constructed, with no attempt at elegance or show. The main structure is forty by eighty feet on the ground, and twenty-five feet high in the clear. Adjoining it on one side is a large carpenter shop, and on the other a blacksmith shop, where all the necessary blacksmithing and carpentering is done for the mine. The machinery of the mine consists of double hoisting engines of sixty horse-power, a pumping engine of eighty-horse power, one 54-inch and one 60-inch boiler—each sixteen feet long and having sixty-four three inch flues—all of the very best and appropriate to the work in hand. The shaft is supplied with an eight-inch pump, with six feet stroke, which keeps a constant stream of thirty-six inches (miner's measure) of water flowing from the mine. Two wire cables, three and one-half by one-half inch are used in hoisting the cages and tanks. At a depth of 200 feet in the shaft a "balance bob" has been placed to regulate the workings of the pump. The shaft is of three compartments. At the 200-foot level a drift has been run west through solid rock, and cutting the ledge at a distance of 450 feet from the shaft, the vein being fully 200 feet wide at this point, the ore of which mills from \$7 to \$12 per ton, although some of the assays run as high as \$30. From this drift a north level has been run along the west wall a distance of 450 feet to the south line of the Dayton company's ground, which the Kossuth adjoins, and a south level driven in on the wall 800 feet, opening the vein a total distance of 1,250 feet. The ore and ledge matter for the entire length of the north level is of the same quality as where the drift cuts the vein. In the south drift there is a steady and rapid change in the character of the vast mass of mineral for the better, and at a distance of 300 feet it has changed almost entirely. It has here turned into the true white, silver-bearing rock, being a faithful representative of the upper Comstock rock. At various distances cross drifts have been run east to prospect the vein, and have demonstrated that not only the width of the vein is uniform throughout, but the quality of ore also. At the 350-foot level the ledge has been cut by a west drift of 220 feet, and the vein is found to have narrowed from 200 feet to 80 feet wide, with rapid contraction. The vein matter has grown compact and presents a still better quality of ore, with walls and blue clay casings as perfect as one would have made them himself, had he the power. The genuineness of the fissure is abundantly proven both on this and the level above, as well as the 500-foot level below. At the 500-foot level a west drift of eighty-six feet has been run to the ledge, which is here found to be eighty-five feet, or nearly the same width as at the level above.

IMPROVED METHOD OF TEACHING THE ALPHABET.—M. Tholhoie has, authorized by the French school inspector, applied in the primary schools in Paris his improved method of teaching the alphabet and reading. It is done by the help of a small wooden box, divided into compartments, each holding a letter, sign, or figure. Each scholar has such a small box, and the teacher a much larger one. The teaching is done by naming a letter, say A, and the teacher takes it from his box and shows it to the class; each pupil does the same, and places his letter on the inside of the cover of his box, which, when opened, turns over like a desk. In this way the child is forced to give attention, while he is entirely occupied with eyes, mind, and hand. The experiment of M. Tholhoie has already proved eminently successful. In the first school he undertook to teach, twenty-five children were given him totally ignorant of their letters, and in two days fifteen of them knew them tolerably well. But after this the greatest advantage commences, namely, letting the child form his words with the letters. Such alphabetical blocks are sold as useful toys for children in most of our toy stores, and they should be more extensively used by teachers in all our primary schools.

Opening for Mining Enterprise.

One of our oldest and most intelligent miners, says the *Mountain Democrat*, (El Dorado county,) who has with eminent success handled big enterprises, makes the following suggestions:

Everybody is aware of the immense gold-bearing gravel range in this vicinity. As an outlet for hydraulic operations on this grand deposit, attention has been directed towards Webber creek, and it is already manifest that the operation of a few years will make several miles of cutting and tunneling necessary to obtain adequate dumpage in that direction. Now, it is pretty generally known that a monster quartz ledge—the "mother lode" of this entire section—crosses from Cedar ravine to Big canon. A tunnel started from a point on Big canon, nearly opposite the flume which crosses the road beyond Hunger's slaughter-house, and follow the mother lode on a good slanting grade, would probably be about one hundred feet below the bed of Hangtown creek where it would cross the line of that stream, would completely drain the Pacific and adjoining quartz claims, and would tap the great gravel range at a point from which thirty million cubic yards of rich gold-bearing gravel might be run through it, affording unlimited dumpage, the best in California, on the high and steep hills which tower to the southward of the South fork. Our miner friend thinks this tunnel would not need to be more than 3,000 to 3,500 feet in length. He is sanguine that the quartz taken out in running it would fully pay all expenses, with more than a probability that a No. 1 quartz mine or mines would thereby be developed and opened in good shape for profitable working, the flume carrying off the waste and a track carrying the pay rock to a mill or mills at the mouth of the tunnel.

We confess that these suggestions have excited our lively interest. We commend them to the further consideration of our capitalist friends.

Quartz Mining in Montana.

This *Montanian* of a recent date says: There is no question that much of the future prosperity of Montana will depend upon the development of the mineral deposits that are looked up in the quartz lodes which abound in this Territory. But it is certain that many of these lodes cannot be worked profitably by those who claim the ownership of this property, and unless the aid of capital can be secured for opening the mines and reducing the ores contained therein, the richest veins are comparatively worthless. It has been the experience of the past that whenever capitalists have wished to invest in property of this description, it has been held at such fabulous figures as to discourage and disgust those who could by their money and influence reveal some of the hidden wealth of our Territory. The writer can recall to memory many instances in which the owners of quartz lodes could have disposed of their possessions for what would be considered a moderate competency, but refused the offer, and to-day the mines which might have been developed are lying in the same condition as when they could have been sold to parties who were able to develop them, and test their producing capacity. It is a fact that the mines of Montana are now attracting the attention of Eastern and Western capitalists to a greater extent than ever before—except, perhaps, during the time of the great mining excitement of '63 and '64—and it is very likely that the next traveling season will bring many such to the country with a view to investing in them. There are very few places in the Territory where the work of opening quartz mines cannot be carried on as rapidly in the winter as in the summer, and owners of this kind of property will do well to put it in such shape as will make a favorable showing to intending purchasers. The day has gone by when men will invest a fortune in mines on the mere showing of a piece of float ore, or a cradle on the surface where quartz may be found; but wherever the prospector can show that he possesses a mine that will pay a reasonable percentage upon the cost of working, he can rely upon soon finding a purchaser for his property, provided he does not hold his breath too long while considering the length of the buyer's purse. The practice of "bleeding" capitaliste to the greatest possible extent has done more to retard the progress of Montana than perhaps any other thing; but we believe that our people are awakening to the truth that undeveloped quartz is worse than none at all, and that the owner has the biggest kind of an elephant upon his hands. If our miners go to work and show that they have good ledges, and then sell them at reasonable prices to those who have the will and ability to work them, we shall soon see such an impetus given to this branch of mining industry as will place Montana in the front rank of money-producing countries.

IMPORTANT OUTLOOK FOR GAS FUEL.—The iron makers of England are very much astonished at the success attending the use of natural gas, in metallurgical operations at Pittsburgh; and the indications are that our English cousins will soon apply artificial gas fuel to some of their furnaces. A rotary puddler will probably be the first with which they will experiment. If that succeeds, we shall soon hear of the further and more general application of gas fuel.

MECHANICAL PROGRESS.

Engines for Steep Grades.

On railroads where steep grades have to be overcome, it has been the general practice to detach the locomotive and to haul the train up the incline by the aid of wire ropes moved by a stationary engine placed at the top of the hill. If the grade is not too severe, the locomotive is commonly able to take itself up the incline. Where this is possible, two novel modifications of this idea have been introduced, and the locomotive takes the place of the stationary engine. In each system a rope and winding drum is used. In one the drum is fixed on the engine, in the other the drum is fixed at the top of the incline. By the first method the engine is provided with gripping struts that, on being let down, grip the rails and anchor the engine securely. The winding drum is fixed to the frame of the engine, and has the wire rope wound up on it. On reaching the foot of the grade, the engine is detached from the train, the end of the rope is secured to the first car, and the engine mounts the incline to the top, or as far as the rope will permit. The gripping struts then anchor the engine, and, on applying power to the drum the train is hauled up. If the top of the grade is not reached, gripping struts are applied to the cars, and the engine goes and repeats the operation. The grade being overcome, the engine is again coupled and the train continues its journey. By the other system, the winding drum is fixed in a sunken pit at the top of the incline, and is provided with a wire rope for dragging up the train. This winding apparatus is provided with four driving wheels coupled in pairs, and so placed as to have their upper surface just level with the tracks. A gap is left in the rails over each wheel, so that it may turn freely. On reaching the foot of the incline, the engine mounts the hill alone and runs over the winding drum till its four driving wheels exactly coincide with the wheels of the drum. In fact, it rests upon them, and is locked in that position. The wire rope meanwhile is secured to the train. On starting the engine the driving wheels turn those it stands upon by friction, and in place of moving outward it stands motionless and turns the winding gear. By this simple means the train is dragged up the incline till it rests upon the higher level. The engine is then unlocked, and joining its train on the main line, it resumes its duty. On descending the grade, both train and engine are lowered in safety by the rope under the control of a brake on the winding drum. Both of these systems are still in the experimental stage.—*Scribner's World's Work.*

STREET RAILROAD TRANSIT.—The municipality of Paris, though slow in adopting street railroads, seems to be making rapid improvements in motors for propelling the cars since such railroads have been adopted. Successful experiments were first made on a line between Porte Maillot and the bridge of Neuilly with a new machine driven by compressed air, which took the cars at a high rate of speed with a small power, and with easy management in quickening, slowing or stopping. More recently successful experiments have been made with still another dummy, driven by steam and with coke as a fuel, the inventor being Mr. Harding, an Englishman. Of one experiment with it the *Correspondance Havas* says: "A car containing forty-four persons, all of them comfortably seated, was drawn by this dummy from the Place St. Germain-des-Près, over the line of the southern tramways of Paris through the Rue de Rennes, the Boulevard Montparnasse, the Avenue d'Orléans and the Avenue de Châtillon, to the fortifications. The trip occupied sixteen minutes going (up hill) and twelve returning, and was performed at the rate of twelve kilometers, or about seven and a half miles an hour. The speed of the dummy was completely under control; the car was stopped and set in motion more easily than with horses, and the horses in the street were not in the least disturbed by the engine. The authorities expressed their entire satisfaction with the experiment."

THE USE OF PETROLEUM IN DRILLING.—We have already, in these columns, made reference to the use of petroleum in drilling, and we now copy the following from the *Messageur Franco-Américain* of New York: "A curious effect of petroleum has been discovered. It is well known that the boring or turning of certain pieces cast from very hard metal, like steel and varieties of bronze, is a most difficult operation; often the best tools cannot be got to make an impression on the metal; they get soft or break without producing any practical effect. It now seems that an English engineer has discovered that steel tools, continually oiled with petroleum, or a mixture of petroleum and spirits of turpentine, will drill without difficulty the hardest alloys of steel or bronze. This discovery is important at this precise moment, when a new artillery is being made of steel or compressed bronze, called Uchatius bronze, after the inventor, an Austrian officer."

THE DANKS FURNACE.—It is stated by the *American Manufacturer*, that Mr. Danks is now in Birmingham instructing his lawyers preparatory to commencing suit against Mr. Crampton for using, in his furnace, inventions embraced in the Danks.

A NEW SYSTEM OF PRISON CONSTRUCTION.—The *Popular Science Monthly* describes a new system of prison construction, which has recently been covered by a United States patent. We extract as follows: "The cells are lined with the hardest cast iron, the doors, windows, frames and sashes being of one piece with perforations. As wrought iron is easily cut and filed, there is none of it used. The plates are connected without bolts or rivets. Any attempt of a prisoner to escape by cutting the walls of a cell is checked at once by the hollow wall system. The space in the wall, door and ceiling is filled with kiln-dried sand, or other mobile material, which runs through an outlet by an opening that might be made, rendering it impossible for any prisoner to dispose of the same. An inexhaustible supply of this sand is furnished by a hopper constructed near the roof of the building or on top of the cells. Brick or wood walls, and single or double iron lining can be used for this system. In addition to the last mentioned plan, an alarm apparatus is connected with the sand, so that any noise or disturbance arising from cutting in any portion of the cell, is instantly heard in any part of the building. There is no limit to the number of places at which such alarms can be given simultaneously. In general, the system is ample and complete in all its details, and is well worthy attention of cities, counties, States and general governments requiring prisons of any grade of construction or cost."

NEW MODE OF MAKING BOLTS' NUTS.—Puddled bar is rolled into the required shape to make a hollow pile, by forming two sides with top and bottom of half circle, octagonal or hexagonal, exterior or hollow fagot, just as may be desired. This pile is heated in the usual manner, and before being given to the rolls, a mandril is introduced into the exterior or hollow of the pile, which mandril is held in position by being attached to the end of a rod or chain, the other end of which is supplied with a collar, which falls behind a notched rest or brace, which holds the mandril in place as the pile is introduced to the bite of the rolls, and passes through them. Thus the exterior of the bars and the interior are formed at the same time, and the weld completed. The further reduction and finish of the bar is accomplished by a repetition of the manipulation in the successive use of smaller mandrils and smaller grooves in the rolls. Then, before the bar has lost the heat, it is given to a gang-saw, and by one movement cut up into blanks of the required thickness, of exactly uniform size and weight, ready for the reamer and milling and chamfering machine. It is claimed that nuts can be manufactured much cheaper by this process than by the old methods; they are stronger, and consequently can be lighter, and thus more of them obtained from a given weight of iron.

NEW MATERIAL FOR BUILDING.—A material suitable for blocks and bricks is, according to the invention of Messrs. Smith and Patterson, of Glasgow, made from two mixtures. The first contains coal tar, mixed with small broken stones or shingle, a portion of which should be pulverized or mixed with sand, so that the interstices between the stones of larger size may be properly filled up. The second mixture is composed of clay and pitch; sand or chalk may be substituted for the clay. The first mixture is mixed in a mixing apparatus at a heat which is gradually increased until the product is adhesive to the touch. The second mixture is formed by grinding the powder thus obtained, and is added to the first mixture while its particles are adhesive to the touch. The mixture of the two compounds is confined in a close vessel and heated so as to diffuse the vapors uniformly throughout the ingredients. In manufacturing a building block, the material having been tested is removed while hot to moulds, and pressed and shaped as required.—*The Builder.*

HOW TO APPLY A LEATHER COVERING TO AN IRON PULLEY.—Upon the question how to apply a leather covering to an iron pulley, some light may be shed by the following description of a process by which it is said that leather may be affixed to a metal so that it will split before it can be torn off. A quantity of nut-galls, reduced to powder, is dissolved in eight parts of distilled water, and after remaining for six hours is filtered through a cloth; and the decoction thus produced is applied to the leather. Take the same quantity of water as that used for the nut-galls, and place in it one part (by weight) of glue, which is to be held in solution for 24 hours, and then applied to the metal, which should first be roughened and heated. The leather is then laid upon the metal and dried under pressure.

INDESTRUCTIBLE TRAINS.—Mr. David Robertson, 79 Robertson street, Glasgow, Scotland, has written to the railway commissioners recommending, as a means of preventing the personal injury and damage to property which result from railway collisions, that passenger carriages should be constructed of strong vulcanized india-rubber, which, he says, can be moulded up to any thickness and degree of elasticity. The carriages would be round at the ends in place of having buffers attached; and these convex ends would become concave in collision, but would not jerk the carriages off the rails like buffers. He proposes that the train should be united by a wire rope passed through eyes underneath each carriage to a windless on a brake behind, which would tighten it up to any tension.

SCIENTIFIC PROGRESS.

The New Element—Gallium.

We have already in these columns made allusion to the new element named gallium, which has recently been discovered by M. Le coq, an amateur French savant. It was discovered through the agency of spectral analysis. Its spectrum is two bright lines in the violet region. One of these, slightly brighter than the other, is in the 417th degree of the scale, the other is at the 405th degree, and both in the place occupied by the brightest lines of zinc. Chemical analysis shows that it is closely related to that metal. It has not yet been isolated, and is known thus far only as a chloride and sulphate.

Up to the present time only a very small quantity of gallium has been obtained, but M. Wurtz, who presented a paper on the subject before the French Académie des Sciences, has given to some members tubes of solution for experiment; and on asking for a commission to examine into the question and to place gallium on the list of simple bodies, the Academy named M. Wurtz himself, joining with him M. Fremy.

Pending the decision of this commission, a question of doubt has been thrown upon the reality of this reported discovery. The *Boston Journal of Chemistry* alludes to the fact that even indium has not yet been fully established as a new metal, and adds: But we should almost suspect the identity of this supposed new substance with indium: 1. Because, as mentioned in the report in regard to this new metal, the other metals discovered by the help of the spectroscopy, thallium, caesium and rubidium are mentioned, but indium is ignored. 2. Indium also produces two lines in the violet, one very bright and the other more faint. 3. Indium was also obtained from zinc blende, namely, that of Freiberg in Saxony. 4. Indium has thus far only been obtained in small quantities, and its properties have been imperfectly studied thus far; as it forms a new field for investigation, we are surprised that Prof. Wurtz, so famous in new researches, appears to ignore it.

If the accounts are correct, however, gallium differs from indium in this respect, that an excess of ammonia redissolves the precipitate of hydrated oxide of gallium first formed, while in the case of indium the precipitate of its hydrated oxide is not redissolved by an excess of ammonia. We look with interest for further reports regarding this supposed 65th element.

THE GERMINATION OF SEEDS IN ICE.—Some interesting experiments on the growth of seeds have been conducted by M. Uloth. These were undertaken with a view to determine whether seeds could be made to germinate in ice, and the process may be described as follows: Seeds of various species were placed in grooves made in ice cakes, and over the grooved surface other plates of ice were laid, and the whole removed to a cool cellar in January, and there they remained till the following May. An examination then made disclosed the fact that many of the seeds had actually germinated, the roots penetrating into the ice. It is but natural, says *Appleton's Journal*, that facts of this startling character should give rise to controversy, and so we are not surprised to learn that opposite views are entertained as to whence the heat needed for the process of growth was obtained. In the opinion of the experimenter, it was obtained, or rather liberated, in the growth of the roots while forcing themselves into the ice.

THE GENESIS OF ATOMS.—Dr. Henry Muirhead recently read a paper before the Philosophical Society of Glasgow on "the Genesis of Atoms, Worlds and Sun-spots," in the course of which he argued in favor of the theory that atoms are formed from ether, molecules from atoms, masses from molecules, and worlds from masses, all matter having originally been of the same character. From the absence of sun-spots in the periods after Jupiter has been at the point in his course nearest to that portion of space through which the sun next travels, he argued that Jupiter influenced the absence of these spots, his explanation of the phenomenon being that the planet at these parts of his course influenced matter floating in space which would otherwise have gone to cause sun-spots. Incidentally in the course of his paper, Dr. Muirhead expressed his belief that the origin of motion was coeval with the origin of matter.

A GAS SHADOW.—A striking and curious experiment, showing the superior weight of carbonic acid over air, may be made by projecting the shadow of the gas, as it is poured from its containing vessel, upon a screen. The latter should be of white paper and bright sunlight should fall upon the stream of gas, which should be poured from the spout of a pitcher held within ten inches of the screen. The curious result of a shadow produced by apparently nothing, will be seen, the former resembling descending smoke, quite black at the spout of the vessel, but brightly illuminated whenever the sunlight is concentrated by passing through the gas.—*Scientific American.*

How Far Will Bodies Sink in the Ocean?

The often repeated inquiries which we receive, as to the depth in the ocean at which heavy bodies will float, prove the great prevalence of the error that water is so compressible as to become at certain great depths considerably heavier, by its own superincumbent weight. The fact is that, on the contrary, water is one of the least compressible bodies, so that, under a pressure of 7,200 pounds per square inch, corresponding to a depth of three miles, its bulk is only diminished from 1,000 to 978 parts, and its weight or specific gravity increased from 1.000 to 1.022. At double this pressure, or 33,600 pounds per square inch, at six miles in depth, the compression is double that amount.

If a body be capable of floating at such a depth, it must satisfy two conditions: First—Its specific gravity must be between 1.000 and 1.044. If the specific gravity is not more than 1.000, it will not sink at all; and if it be 1.044 or above, it will sink to any bottom less than six miles deep. Second—The sinking body must be less compressible than water; if it is more compressible, it will grow comparatively heavier all the time it is descending, and can never find a stratum of the same weight, in which it might float in equilibrium. Now all the bodies known to be less compressible than water are much heavier than the limit given; such are stones, metals, etc.; and the amount of their compressibility, as compared with that of water, is still problematic. But they will certainly all sink to the bottom of the ocean, he it ever so deep.

In regard to the bodies of which the specific gravity surpasses that of water slightly, so as to come within the range under discussion, they are all very compressible. All kinds of wood, when submitted to great pressure, so that all the pores are filled, attain the specific gravity of the primitive wood fiber, the lignin, of which the specific gravity is 1.400; and they will sink to the very bottom, like water-logged wood. So it is with all similar substances; and the theory that there is a certain depth in which all or many bodies may float in the ocean must be modified to a statement that there are various depths at which certain bodies may be kept floating; but that the cases are extremely rare, exceptional and perhaps only temporary, so that all bodies will finally either sink or float.—*Scientific American.*

SIR ISAAC NEWTON'S EXPERIMENTS.—When Sir Isaac Newton changed his residence and went to live in Leicester Place, his next door neighbor was a widow lady, who was much puzzled by the little she had observed of the philosopher. One of the Fellows of the Royal Society of London called upon her one day, when, among other domestic news, she mentioned that some one had come to reside in the adjoining house, who, she felt certain, was a poor crazy gentleman, "he became," she continued, "he diverts himself in the oddest ways imaginable. Every morning, when the sun shines so brightly that we are obliged to draw the window blinds, he takes his seat in front of a tub of soapsuds, and occupies himself for hours blowing soap bubbles through a common clay pipe, and intently watches them till they burst. He is doubtless now at his favorite amusement," she added; "do come and look at him."

The gentleman smiled, and then went up stairs, when, after looking through the window into the adjoining yard, he turned round and said: "My dear madam, the person whom you suppose to be a poor lunatic is no other than the great Sir Isaac Newton, studying the refraction of light upon thin plates, a phenomenon which is beautifully exhibited upon the surface of a common soap bubble."

This anecdote serves as an excellent moral not to ridicule what we do not understand, but gently and industriously to gather wisdom from every circumstance around us.—*Druggists' Circular.*

MORE PALEOZOIC FROGS.—Usually the venerable batrachians which have survived from the carboniferous or a still earlier epoch are discovered in solitary confinement and in a cell no larger than the body of the captive it contains. According to a Glasgow daily paper, however, a perfect swarm of frogs, and what is more remarkable, young frogs, has been found while driving a shaft through sandstone in the Shieldmain coal-pit, Motherwell, at a depth of 330 feet from the surface. Several dozens of young frogs were thus found lodged in the cavity of a stone. The term young, however, can be only comparative when the millions of ages they have lived is considered. What is likewise very remarkable, as soon as they were liberated they betook themselves to a pool of water, where they seemed quite at home, a remarkable instance of inherited instinct or retentive memory.

CONDUCTION OF HEAT BY BUILDING MATERIALS.—The coefficient of conduction for heat of various building materials has lately been carefully investigated by Lang, who, in his studies, has endeavored to exclude the influence of radiation, and has made measurements by means of the thermo-electric multiplier. He finds that the stones considered by him are much better conductors of heat when wet than when dry, and that various classes of stones, such as marble, sandstone, granite, etc., have approximately the same coefficients of conduction, while bricks of all kinds are much worse conductors than the natural stones.

MINING SHAREHOLDERS' DIRECTORY.

ASSESSMENTS.—STOCKS ON THE LIST OF THE BOARDS

Con Virginia.....	380	\$234	255	Con Virginia.....	408	\$411	
100 ..do.....	155	\$293	25	do.....	5	\$110	
100 ..do.....	5	\$30	570	Orona Point.....	28	\$278	
1015	Crowa Point.....	274	\$284	260	Empira Mill.....	35	\$254
100	Imperial.....	87	\$281	120	Imperial.....	12	\$134
30	do.....	1	\$5	80	G & Curry.....	19	\$120
200	Caladonia.....	233	\$241	255	Hale & Nor.....	48	\$249
15	Mayton.....	42		755	Imperial.....	43	\$232
315	Imperial.....	87	\$281	210	Juarez.....	2	\$261
50	Europe.....	14		730	Julia.....	16	\$241
315	Gould & Curry.....	19	\$218	130	Kentuck.....	14	
50	Hale & Norcross.....	4		10380	Ledy Bryan.....	33	\$241
425	Imperial.....	87	\$281	315	Mexican.....	18	\$241
200	do.....	5	\$30	30	do.....	5	\$20
820	Julia.....	14	\$241	895	Uphir.....	56	\$256
650	Justice.....	26	\$221	50	do.....	5	\$5
425	Imperial.....	87	\$281	475	German.....	2	\$261
470	Leviathas.....	2	\$261	13	do.....	5	\$22
6450	Lady Bryan.....	23	\$221	1180	Savage.....	17	\$171
100	Imperial.....	87	\$281	2155	Sierra Nevada.....	21	\$237
100	Monumental.....	5	\$10	95	Union Con.....	5	\$20
100	Mides.....	7		375	Yellow Jacket.....	105	\$107
100	do.....	7					
100	New York.....	2					
220	Uphir.....	47	\$471				
400	do.....	5	\$5				
220	Overman.....	1					
50	Occidental.....	3					
240	Phil Sheridan.....	87	\$2				
200	Rock Island.....	3					
50	Silver Hill.....	1					
325	Savage.....	14	\$141				
350	Sierra Nevada.....	20	\$219				
55	Sag Belcher.....	67	\$68				
135	Union Con.....	5	\$241				
190	Uphir.....	47	\$471				
210	Wells-Fargo.....	20					
105	Woodrill.....	1					
130	Yellow Jacket.....	100					
AFTERNOON SESSION.							
840	Alps.....	10	\$14	100	Alpa.....	1	\$14
240	Advance.....	5	\$12	850	Andes.....	34	\$234
50	Alpha.....	5	\$18	20	do.....	5	\$14
100	Belmont.....	10	\$121	400	Am Flat.....	3	\$14
100	Belmont.....	10	\$121	1300	Alta.....	3	\$14
100	Belmont.....	10	\$121	450	Baltimore Con.....	3	
100	Belmont.....	10	\$121	100	do.....	1	
600	Coso Con.....	10	\$121	220	Caladonia.....	22	\$234
55	Con Virginia.....	387	\$387	230	Challenge.....	5	
150	California.....	65	\$70	300	Dayton.....	19	
100	do.....	5	\$5	150	Eureka Con.....	15	\$121
100	do.....	5	\$5	200	Florida.....	5	\$3
100	do.....	5	\$5	850	Gila.....	3	\$234
100	do.....	5	\$5	320	O Chariot.....	1	\$121
100	do.....	5	\$5	150	Globe.....	1	\$121
50	El Dorado South.....	12	\$12	130	Hussay.....	1	
50	do.....	12	\$12	350	Jackson.....	2	\$21
50	Gold.....	2	\$2	100	Jefferson.....	5	\$21
495	Hussey.....	75	\$75	880	Kosart.....	1	\$21
570	Justice.....	26	\$27	900	Leopard.....	11	\$21
850	do.....	26	\$27	200	Lady Wash.....	24	\$234
850	do.....	26	\$27	175	Meadow Valley.....	2	\$234
150	do.....	26	\$27	135	Mides.....	7	
150	do.....	26	\$27	300	N Belmont.....	2	\$20
150	do.....	26	\$27	600	N Belmont.....	1	\$14
150	do.....	26	\$27	490	Occidental.....	2	\$2
30	Mexican.....	18	\$18	520	O Hill.....	3	\$234
70	Meadow Valley.....	24		55	Pioche.....	4	\$20
220	New Coso.....	1	\$134	55	Hill.....	2	\$20
150	do.....	1	\$134	100	Panther.....	2	\$241
140	Overman.....	2	\$263	610	Ramond & Ely.....	17	\$134
265	Prusian.....	1	\$161	100	South Obiarot.....	5	
175	Panther.....	87	\$15	15	do.....	5	
185	do.....	87	\$15	300	Uphir.....	47	\$471
160	Sierra Nevada.....	19	\$20	10	Woodville.....	2	\$2
70	Yellow Jacket.....	98	\$98				

The Mining Share Market.

During the past week stocks have gone up a little, and in some instances considerably. No one can tell yet, however, whether there will be a lively market or not for any length of time. The rise may be only temporary and fall back to its usual status of late; but the brokers and speculators hope to the contrary. News from the prominent mines continues encouraging. The general tone of the market of late has been strong, at advancing rates, but notwithstanding these great appreciations in prices, brokers complain of the scarcity of orders, which is clearly accounted for by the high premiums demanded for money. Accommodations to a slight extent are made, and these small loans receive the same prominence as if millions had been advanced at low rates, so scarce have been these loans. The fluctuations in the market can be seen by reference to our stock tables for each day during the past week.

In the Belcher mine the connection has been completed between the upraise from the 1400-ft level and the air shaft below the 1300-ft level, greatly benefiting the circulation of air in that portion of the mine. The improvement created by this air shaft has been so great that 300 men now perform the work that it took nearly 1,000 to do before the air shaft was started.

Thoreday morning John Bosanco, a miner working in the Combination shaft on the Comstock, fell about one hundred feet, striking on a platform of two-inch planks and crashing through them to the bottom of the shaft, a few feet below. In spite of all this he suffered no more than a cut on the head, a few bruises and three broken ribs.

The etemps in the new California mill, on the Comstock, have 3½ inch etems, being half an inch larger than any before used in the mills of that section. They weigh 900 pounds each. The mill will be supplied with every improvement and convenience that can be devised, and will be a model construction of the kind.

C. C. STEVENSON, president of the Nevada board of Centennial Commissioners, left Virginia last Wednesday for Philadelphia. He goes East to secure the room in the exposition likely to be required by Nevada.

The stockholders of the smelting works at Hamilton are looking into the affairs of that enterprise, which has not answered their expectations, and they allege it is owing to the bad management of the superintendent.

A PARTY of surveyors have been examining

ny.	Location.	No.	Amt.	Levied.	Delinq't.	Sale.	Secretary.	Place of Business.
Co	Nye Co Wash	7	50	Dec 9	Jan 13	Feb 8	F Swift	419 California st
& S M Co	Wash	16	50	Dec 23	Feb 1	Feb 8	O A Sankey	331 Montgomery st
& M Co	Cal	1	50	Jan 1	Feb 15	Feb 15	J W Helman	320 California st
il & M Co	San Diego Co Cal	5	10	Dec 11	Jan 11	Feb 4	F Swift	419 California st
ns M Co	Washoe	15	50	Dec 20	Jan 25	Feb 5	G R Spinyer	320 California st
ns M Co	Cal	1	50	Dec 27	Jan 27	Feb 15	W M Helman	308 California st
& M Co	Nev	3	50	Jan 11	Jan 11	Feb 3	W M Helman	330 Pine st
& M Co	Washoe	50	Dec 3	Jan 7	Jan 25	J Maguire	419 California st	
ariot M Co	Idaho	15	75	Dec 13	Jan 19	Feb 9	L Kaplan	Marchants' Ex
M Co	Washoe	25	1 00	Nov 9	Dec 14	Jan 4	P R Dean	419 California st
Co (New Stock)	Washoe	17	1 00	Nov 20	Dec 14	Jan 4	J J Kennedy	Marchants' Ex
alley M Co	Washoe	6	1 00	Nov 30	Jan 4	Jan 25	J Swift	419 California st
Co	Pioche	10	50	Dec 23	Feb 5	Mar 3	T W Colburn	418 California st
Co	Idaho	6	20	Nov 9	Dec 15	Jan 6	W F Bogart	402 Montgomery st
Co	Ely Dist	8	25	Dec 11	Jan 1	Feb 8	C E Elliott	418 California st
& S M Co	Washoe	9	25	Nov 26	Dec 17	Jan 18	W M Helman	404 California st
& Ely M Co	Idaho	4	50	Nov 24	Dec 29	Jan 18	W Willis	Nevada Block
& M Co	Pioche Dist	5	3 00	Nov 5	Dec 14	Jan 10	T W Colburn	418 California st
& M Co	Washoe	21	1 00	Dec 17	Jan 19	Feb 8	E B Holmes	308 Montgomery st
& M Co	Washoe	13	1 00	Dec 29	Jan 29	Feb 8	W M Helman	308 Montgomery st
& M Co	Nev	8	30	Dec 11	Jan 25	Feb 23	A F Coffin	12 Mendocino st

Quicksilver M Co	Cal	2	5	Dec 15	Jan 20	Feb 13	A L Fuller	320 Sansome st
Nevada	Washoe	1	10	Dec 4	Jan 10	Feb 2	L Hermanson	230 Fine st
Yuma M Co	Cal	5	5	Oct 25	Jan 13	Jan 15	D Howell	520 Montgomery st
Cal	Washoe	25	10	Dec 10	Jan 13	Jan 31	I T Milliken	301 Montgomery st
Plat Blue Gravel Co	Cal	35	5	Dec 28	Jan 29	Feb 19	O H Rogart	328 Montgomery st
Cal	Washoe	1	20	Dec 10	Feb 2	Feb 22	W B Rogers	401 Montgomery st
Quicksilver M Co	Cal	6	15	Nov 24	Jan 3	Feb 10	W Stuart	118 Leidesdorf st
Water & Gravel Co	Cal	12	200	Dec 29	Jan 31	Fah 16	H Elias	421 Montgomery st
Butte Co	Cal	7	5	Nov 24	Jan 3	Jan 22	A N Paul	13 California st
Quicksilver & M Co	Cal	2	20	Nov 12	Jan 13	Jan 22	S B Stewart	200 California st
Cal	Cal	2	10	Nov 20	Dec 27	Jan 24	F B Rogers	Academy Bldg
Ill M Co	Grass Valley Cal	5	50	Nov 26	Jan 5	Jan 27	F J Harman	44 Kearny st
Quicksilver M Co	Washoe	14	20	Dec 10	Jan 13	Jan 22	Thos A. Morse	Stearns Bldg
Quicksilver M Co	Cal	3	30	Nov 12	Dec 31	Jan 25	S H Smith	6 Montgomery st
Quicksilver & M Co	Cal	3	100	Nov 30	Dec 31	Fah 1	L Leavitt	309 California st
Quicksilver M Co	Nev	3	10	Dec 16	Jan 20	Fah 12	W A Van Bokkelen	220 Sansome st
Quicksilver M Co	Nev	5	50	Dec 10	Jan 13	Jan 31	W N Taylor	Black Block
Quicksilver M Co	Cal	8	5	Dec 2	Jan 3	Fah 14	D Wilder	Merchants Ex
Quicksilver M Co	Nev	1	30	Nov 1	Dec 15	Jan 15	J E McDonald	405 California st
Quicksilver M Co	Nev	5	5	Nov 30	Dec 15	Jan 12	W Ags Knapp	116 Leidesdorf st
Quicksilver M Co	Cal	12	25	Dec 14	Jan 15	Feb 5	O Jakes	Express Bldg
Quicksilver M Co	Idaho	8	25	Dec 16	Jan 20	Fah 9	W Willis	Nevada Block
Quicksilver M Co	Cal	3	8	Dec 10	Jan 15	Fah 13	R de Clairmont	Front & Jackson
Quicksilver M Co	Nev	5	50	Nov 20	Feb 2	Fah 20	C A Egan	Front st
Quicksilver M Co	Eureka	5	10	Dec 7	Jan 20	Feb 19	F B Bunker	606 Montgomery st
Quicksilver M Co	Washoe	3	25	Nov 11	Dec 16	Jan 4	J M Buffington	309 California st
Quicksilver M Co	Cal	65	65	Dec 9	Jan 19	Feb 19	S S Murfey	607 Montgomery st
Quicksilver M Co	Cal	1	10	Dec 12	Jan 12	Feb 12	W B Rogers	Montgomery st
Quicksilver M Co	Nevada	2	20	Nov 11	Dec 13	Jan 4	D A Jennings	401 California st
Quicksilver M Co	Cal	3	25	Nov 24	Jan 4	Jan 24	J Gleason	335 Montgomery st
Quicksilver M Co	Cal	1	20	Dec 16	Jan 27	Feb 16	E B Ford	201 California st
Quicksilver M Co	Calaveras Co Cal	7	20	Dec 16	Jan 27	Feb 16	Wm Macdonald	311 California st

of Co.	Location.	Secretary.	Office in S. F.	Meeting.	Date.
Co	Washoe	J S Kennedy	Merchants' Ex	Annual	Jan 15
Mining Co	Washoe	O B Gordon	Nevada Block	Annual	Jan 19
M Co	Nev	J P Moore	320 Sansome st	Annual	Jan 30
ula M Co	Washoe	Chas H Fish	Nevada Block	Annual	Jan 13
al M Co	Oregon	T P Beech	77 Montgomery Block	Annual	Jan 10
M Co	Nev	T O Kihich	419 California st	Annual	Jan 12
M & M Co	Nev	W Ans Knapp	Nevada Block	Annual	Jan 10
		R H Brown	402 Montgomery at	Annual	Jan 10
al Gravel M Co	Cal	F H Rogers	Academy Bldg	Annual	Jan 10
	Nev	A B Carpenter	605 Clay st	Annual	Jan 11
M Co	Nev	F E Lutz	507 Montgomery st	Annual	Jan 30
M Co	Nev	F M Burlington	311 California st	Special	Jan 30
and & M Co	Cal	L Leavitt	309 Montgomery at	Annual	Jan 13
S M Co	Nev	J Maguire	419 California st	Annual	Jan 30
and Tunnel & Smelting Co	Nev	Tbeo C Kibbo	419 California st	Annual	Jan 10
S & M Co	Nev	R T Brown	402 Montgomery Block	Annual	Jan 30
I Co	Oregon	J Hand	1201 Battery st	Annual	Jan 10
ross M Co	Nev	S O Herbert	535 Clay st	Annual	Jan 10
	Nev	D A Jennings	401 California st	Annual	Jan 10

of Co.	Location.	Secretary.	Office in S. F.	Amount.	Payable.
Quartz	Cal	W L Oliver		25	Sept 13
nia M Co	Washoe	Chas H Fish	401 California st	10 00	Dec 11
Co	Nevada Co Cal	D A Jennings	401 California st	50	Sept 15
en M & M Co		A K Burbrow		50	Oct 11
ello M & M Co		W Willis	419 California st	1 00	Dec 13
tock G & S M Co	Washoe	Oliver G Wood	534 California st	50	Dec 21

...ing is mostly condensed from journals published in the interior in proximity to the mines mentioned.

HOPE ROCK.—Amador Dispatch, Dec. 10. Notice that Mr. Charles Peters, proprietor of the Good Hope mine, has been engaged several days past in hauling quartz from the mine to the Volunteer mill for the purpose of having it crushed and its richness tested.

mine, at Sutter Creek, about 12 o'clock last night, the 19th, causing considerable destruction thereabouts for a while and resulting in considerable pecuniary damage to the mine, but fortunately no lives were lost. The amount of damage done to the mine is not known, however, as the shafts and tunnels were all closed up as soon as possible after the alarm was given and the men were alerted, in order to smother the fire. The mine is supposed to have caught from a candle which some of the workmen who were engaged in repairing the ladder which was damaged several days ago by the falling of a bucket of

TOWN DITCH.—Oroville *Mercury*, Dec. 10, N. D. Plum, of Forbestown, we learn, has had a fine success in clearing up men have been at work most of the year, so that the coming season it will be a great deal more water than ever before. The work was laid out for this season, this was the work laid out for this season, and one great object they had in view was to furnish a supply to the ranches at Bangor, Evansville and Wyandotte. The resident, Mr. Green, well said that it was the minees would be worked out, and the ranches would last a lifetime, and to look for his best and most lasting work. The company are doing as they should, which is a guarantee that the plan will be carried out.

NEW MILLS.—*Calaveras Chronicle*, Dec. 25: The new mill at the Mt. Tmolus mine is finished and the battery in motion. There is a large quantity of rich ore in the dumps, and any amount of it in sight in the mine. The stamps are kept running day and night.

MONTE CRISTO.—WORK COMMENCED.—Work has been recommenced upon the Monte Cristo mine, Mosquito, Glencoe district. The mine has passed into the hands of Mr. H. Longley, superintendent of Garland's mill, who intends to thoroughly develop it, and has the necessary means and facilities. Considerable rock has previously been taken from the Monte Cristo which paid remarkably well.

intelligence of large yields from operations in quartz in the Glencoe district. Garland's, the principal custom mill in that section, is kept in constant employment, and the results of crushings are so favorable as to stimulate the working of mines in the district into increased activity. Labor is being expended on a great number of ledges with very satisfactory results in general. The last run of Garland's mill was made on rock from the well known Rickman mine, located in the suburbs of the village of Mosquito. Twenty-nine tons of ore were put under the stamps, yielding an aggregate of \$700—about \$25 per ton. There is no limit to the quantity of rock in sight in the mine, that will pay equally as well as the last crushing.

feet deep; running levels in good ore. Mina Rica is down 290 feet. The south level is through the dyke which is the north boundary of a rich ore chute. Ore looks splendid. The ore is accumulating very fast on the dump, beside employing the 8-stamp mill of the Enterprise Consolidated company. A much larger mill will be needed at an early day. The Champion crushed 22,000 tons recently which yielded a triefe over \$3,000—\$136 per ton. Some fifty tons of ore on the dump now. Crushing. Shaft 170 feet deep. The mine cannot be bought at any price.

from the Beckman mine paid \$29 per ton. Other crushing were made by other parties and yielded between \$25 and \$35 per ton. The owners are very reticent. The old shaft of Hadlock's mine is being retimbered. Albers is taking out the ore near his residence. The

Valentine is still under the tender care of lawyers. The Glencoe Consolidated appears to be the center of attraction. Quite a number of men are prospecting in its immediate vicinity. Preparations are being made by the superintendent to work the mine extensively at an early day.

INYO.

THE DEFIANCE FURNACE.—Inyo Independent, Dec. 25: The Defiance furnace was started up again last Monday, but only ran till about eleven o'clock that morning, getting out thirty-four bars, when the pump gave out, rendering it necessary to shut down again till that could be put in working order; started up again on Tuesday night with a fair prospect of a continuous run of two or three months. The first seven hours after starting on the last heat fifty-one bars were run out and at the end of that time was ready to tap again, so it will be seen this bids fair to be the champion furnace of the country, as the mine, so far, undoubtedly is among mines.

THE FIRST SHIPMENT.—The Defiance company made their first shipment of six and a half tons of bullion last Monday. This was a portion run out the first three days prior to having to shut down the furnace to repair the break in the bottom.

NAPA.

A QUICKSILVER MINE AT YOUNTVILLE.—Napa Register, Dec. 25: There is a fair prospect that Yountville will become something of a mining locality. Prospecting has been going on for some months past about a mile west of Charles Hopper's place, and a tunnel has been put in 100 ft; but the most promising specimens have been found outside the tunnel. Some specimens have been found which are pronounced very rich by experts. We have been shown some of them by Mr. Lyman, who has just surveyed the claim for a United States patent, and we reckon the exports may be light in their opinion. The mine has been christened the Mountain View, and is owned by A. S. Roney, R. Simmons, Wm. Johnson and Chas. Hopper.

NEVADA.

MINING ITEMS.—Nevada Transcript, Dec. 24: We understand the Selby Hill mining company, which was recently incorporated, will commence work on Selby hill in a short time. The Gold Tunnel hoisting works, recently put up, are about ready for operations. The Gold Flat quartz mine, known as the Gold Run, is looking splendidly now. The mines at Blue Tent are at work; water is obtained from the South Yuba canal company's ditch, and from the new ditch run the past year by the Blue Tent Consolidated company; the latter company have as yet only run about 600 inches of water to Blue Tent this winter, fearing, as their ditches are new, to run it to its fullest capacity. On the ridge all the mines are at work, and a clean up in some of the best ones will soon take place, and the gold be turned loose upon the market. In Little York township all the companies are washing, and plenty of water can be had by all. Gold ought to begin to come in lively next month.

PROSPECT COMPANY.—Foothill Tidings, Dec. 25: Mr. Ambrose Powning informs us that everything in the shape of repairing old tunnels is now completed and that the mine is now in good working condition; that the ledge in the tunnel and stopes is of good size and has the appearance of hearing excellent pay rock. Mr. Powning has had charge of the work for the Prospect company for some time and he seems to feel sanguine that they have a splendid showing in the old Perseverance.

DOWNEY MINE.—Work on this mine has recently been commenced and we understand that the tunnel is to be pushed as fast as possible. We are glad to learn that our old friend Joseph Soper has charge.

PLACER.

IOWA HILL MINES.—Cor. Ditch Flat Forum, Dec. 25: Several of the leading mines in this section have been busy this month, pipping for some twenty days, quite an unusual thing of late years in December. The following is the list as far as I have heard:

The Occident or Kidder claim will wash about twenty days altogether, with eleven hands, eight white men and three Chinamen. This is one of the best fitted up claims in the county. The ground is all good, with suitable pressure and fall. This company have done excellent work so far, having washed an immense amount of dirt.

THE ENTERPRISE.—This company has also made excellent progress for the time they have washed. This claim is also well fitted up, and has good facilities for working.

THE FALLER CLAIM.—The same remarks apply to this company, they having washed more dirt this month than they did all last season.

THE MORNING STAR.—This crack claim was not ready to take advantage of the late rains. It is, however, in perfect order now and will commence when there is sufficient water. It uses 1,000 inches, with 500 ft pressure.

From other water supplies several more claims commenced work at the same time and will probably continue right along. The Homer and Dr. Carr, at Wisconsin hill, the Thrielar, at Iowa hill, and one or two I believe at Independence hill.

HYDRAULIC MINES.—Auburn Herald, Dec. 25: The hydraulic mines in the upper part of the county still continue active, and are making their exertions felt for good. The Auburn gravel mine continues piping away with marvelous effect and good prospects. The Gold

Run ditch and mining company commenced washing through their bedrock tunnel on the 17th inst., day and night. Everything works splendidly. The company have purchased 840 acres of land in Summit valley, and intend to convert it into a reservoir, and use the water in their mines at Gold run.

SAN LUIS OBISPO.

QUICKSILVER MINING.—San Luis Obispo Tribune, Dec. 25: The mining interests of the county are growing brighter with every month's development. There is not a remaining doubt as to the fact of there being one of the richest and most extensive quicksilver belts running through the entire length of the county that is to be found in any portion of the State. The development of these mines will greatly quicken every other industry in the county. At the present time there are probably 250 men at work in these mines, and the amount of money put in circulation through their earnings is already considerable; but let the number be increased to one or two thousands, as it will might be, then everybody would feel its influence. The Oceanic company, for months in succession, last summer, paid as high as \$10,000 a month for wages and material, which gave a great impetus to all classes of business in and about Cambria. The Ocean View mine has now employed 60 men, and must keep up as large a force until the works are all completed. With these facts before us it ceases to be a wonder that the northern end of the county is so rapidly improving.

SIERRA.

HOWLAND FLAT.—Correspondence Mountain Messenger, Dec. 25: The Wink-Eye company have recently struck gravel which prospects well. This ground is the frontage of the Hawk-Eye and Pittsburg claims, and has never before been worked. The owners are energetic and doubtless will succeed. Chittenden & Company are running their tunnel for hydraulic purposes with 8-hour shifts, and hope to be able to complete it early in the spring so as to make use of the extensive water works they have erected at great cost in various parts of the town. It is supposed that they will be richly rewarded, as it is well known that their ground is exceedingly rich. Cox & Co., also the Comet company, are working in large force at their respective hydraulic mines at Pine grove. Both claims have already been worked for a number of years and have paid largely, but with a long water season, as the present one is proving to be, the product of gold will no doubt appear simply terrific. Gourley, Thatcher & Co. are pushing things vigorously at the California, and if good judgment and energy avail anything, will be handsomely rewarded. Besides these claims there are others too numerous to mention.

As I write everything is moving along in its accustomed channel in this once celebrated mining camp. Water is plenty, and all the miners are very busily engaged, and judging from the quantity of ground washed off in the hydraulic claims, will no doubt in due time be handsomely rewarded. All the drifting claims are working fuller complements of men than usual, and it really looks as if this camp would, ere long, again enjoy some portion of its pristine glory. Every one at present is busily employed at something, principally mining, which speaks volumes for the energy and industry of the people. At the Empire eighty men are employed, and the rich gravel is being run out in large quantities and with more economy than ever before in the history of mining. The Virginia company are running their main tunnel ahead as fast as well trained muscle and giant powder will allow, and ere long still another rich bonanza will be added to the mining resources of Northern Sierra.

Nevada.

WASHOE DISTRICT.

CONS. VIRGINIA.—Daily yield, 650 tons of ore. It is with pleasure that we record the fact that this mine is again producing ore at the rate of \$1,800,000 per month. On the 26th of October last the company's hoisting works, machinery, ore houses and mill were a mass of smouldering, red hot ruins. In fifty days from that time all is replaced, stronger, better and more convenient than ever before. All the defects of the old machinery and works have been remedied, and the new, although erected in all the haste possible, does the required work to perfection. It hardly seems possible that such can be the case, but so it is and a whole community—in fact we may say the Pacific coast—rejoices that it is so. The lower levels of the mine are all in the most perfect repair, and were it possible to obtain them, more mills would be immediately added to those already employed in crushing the ore.

CALIFORNIA.—But little has been done on the lower levels during the past week, owing to the want of a dump in which to place the ore extracted while running the prospecting drifts. Sinking the O. & C. shaft is making excellent progress, the rock in the bottom blasting out well. It is now down 912 ft. Work will soon be resumed on the lower levels. The new 60-stamp mill will be ready to start up in a very short time, and will be an immense addition to the crushing power of the Comstock.

OPHIR.—The machinery, both pumping and hoisting, is all running finely, and the water is being steadily lowered in the shaft below the 1500-ft level. The erection of the new incline machinery is nearly completed, and everything in and about the works will soon be ready to resume the extraction of ore from the lower levels. A large force of mechanics and laborers

are employed on the works, and all the energy possible is being displayed in the advancement of the work.

BECKER.—Gold Hill News, Dec. 23: Daily yield, 450 tons of ore. The ore breasts are looking well and yielding the usual amount of good milling ore. The bullion yield promises to be fully equal this month to that of November, the returns showing a large increase in the amount of gold value in the pulp and bullion assays.

KOSSTUTH.—Sinking the winze in the ore vein below the 200-ft level, 600 feet south of the main shaft, is making excellent progress, the bottom in ore assaying from \$23 to \$35 per ton, and which appears to be steadily increasing in value as the winze descends. It is now down 71 ft. The main south drift on the 350-ft level is in a distance of 256 ft, the face in quartz and low grade ore. The ledge at this point is very solid and well defined, and the quartz of a solid character.

JULIA.—The 1600-ft station is completed, and a main drift is being driven toward the ledge with all possible energy, and very flattering prospects. The main southwest drift on the 1500 ft level is being rapidly driven forward, the face in fine ledge matter.

JUSTICE.—The main shaft has reached the 1000-ft level and a new level will shortly be opened to develop the mine at that depth. The drift north at the 800-ft level is running in fine looking vein matter, giving good assays, and should soon reach the main ore body developed in the level above.

SAVAGE.—The water has been drained to the 2200-ft level, so that work can be resumed on the lower levels in a day or two more.

GOULD & CURNY.—There is a considerable portion of the shaft that is in a very bad condition, and it is deemed best to repair it before the water is extracted and work is resumed again on the 1700-ft level. There is considerable water on the 1700-ft level, which will not probably be extracted until the repairing of the shaft is completed.

SIERRA NEVADA.—Sinking the main shaft is going steadily ahead, the bottom in good sinking ground. The main west drift on the 1000-ft level is pressed vigorously forward, the rock in the face being quite hard.

FLORIDA.—West drift at the 400-ft level going ahead, with fine ore indications in the face.

HALE & NOBSCROSS.—Retimbering the main shaft is completed, the guides in place in the shaft, and everything ready to start up at once as the breakage of the main shaft of the pumping engine, which occurred a couple of days ago, is repaired.

IMPERIAL-EMPIRE.—Daily yield, 50 tons of ore. The ore extracted continues of a good quality, and the ore breasts between the 1930 and 1850-ft levels continue to both look and yield well. There has been considerable improvement shown by the prospecting drifts on the 2000-ft level during the past week.

UTAH.—A large force of mechanics and laborers are employed in the erection of the main hoisting works building, which is now almost completed. The heavy stone foundation of the pumping engine is being rapidly repleased.

EUROPA.—The main west drift on the 320-ft level is steadily advancing, the face in soft ledge material of a very encouraging and promising character.

LADY BYRON.—The 500-ft station is completed and sinking the main shaft has been again resumed. The prospecting drifts on the 330-ft level are being steadily advanced.

LEO.—The main southwest drift, following the foot-wall of the ledge, is steadily advancing, the face of the drift in good ore. An east cross cut has also been started, the entire distance of which is also in good ore mixed with an occasional streak of porphyry.

BALTIMORE AND AMERICAN FLAT.—The main incline has reached the 1050-ft level, at which point a new station is being opened preparatory to cross-cutting and prospecting the ore vein at that point.

PROSPECT.—The new hoisting works are now in active operation, and sinking the shaft is resumed with renewed energy. Three shifts of men are putting it down at a lively rate, and the diamond drill is materially assisting. Everything is working splendidly.

SILVER CLOUD.—Work is about being resumed on the old Silver Cloud mine, which lies a short distance to the northwest of the Silver Hill. It is a very eligible and promising location, and good ore has been found in it in former workings.

SUTRO TUNNEL.—Very good progress is being made at present, the rock working favorably. Good streaks of quartz giving healthy assays in gold and silver are obtained, and being fairly within the broad Comstock mineral belt, every foot of progress promises developments of interest. Total length of tunnel to-day, 11,721 ft.

ORIGINAL GOLD HILL.—Daily yield, 20 tons, which is being reduced at the Hope mill. Pulp assays average \$33, and very gratifying results are looked for from the first clean-up, which is to be made shortly. The ore-breasts of the south ore-body at the 340-ft level are looking finely.

GLOBE CONSOLIDATED.—The north drift on the 350-ft level is showing some fine quartz and ore. Preparations for the erection of new and powerful pumping machinery are going steadily forward.

SILVER HILL.—The 4th station in the main shaft is completed, and a drift started to cut the ore vein, which is now in a distance of 33 ft, the face in fair running ground.

CROWN POINT.—Daily yield, 425 tons of ore. The ore breasts show no change whatever.

Sinking the winze below the 1500-ft level is making good progress, the bottom still in ore. The main south drift, on the 1500-ft level, is being steadily advanced without change.

SUCOON.—The strong flow of water struck last week caused a temporary suspension of the sinking of the main shaft for a few days. The water is again reduced so as to allow of a resumption of work at the bottom.

SULLIVAN.—The tunnel having arrived at a point immediately beneath the bottom of the shaft, a station is now being cut out for a raise to connect with the shaft. This raise will have to be 44 feet in extent, which, added to the present depth of the shaft, will make it just 117 ft from the surface to the track floor of the tunnel. When this is completed and the proposed new hoisting works in position, the sinking of the shaft will be resumed. The ore vein or fissure deposit of ledge matter developed by this tunnel and shaft is 180 feet wide between the walls, which are clearly defined.

LEVIATHAN.—Cross-cut No. 3 from the north drift at the 420-ft level is now twelve feet into the vein of rich ore reported last Saturday, and the face of the drift continues in the same, giving assays as high as \$340 to the ton.

BULLION.—Sinking the main incline is making splendid progress. An apraise is shortly to be commenced from the north drift on the 1700-ft level, to connect with the bottom of the incline for ventilation purposes.

OVERMAN.—The shaft has been drained of water, the timbers repaired, and everything put in good shape for resuming the sinking, which will be done in a very few days more.

CHOLLAR-POIOSI.—Daily yield, 60 tons of ore, the average assay value of which is \$28 per ton. There is no change in any of the ore stopes or breasts.

NEW YORK CONS.—Work is being actively pushed ahead at the various prospecting levels, with very encouraging results. At the 800-ft level very good looking streaks of quartz of small size are being passed through.

YELLOW JACKET.—The north and south drifts from the bottom of the winzes on the 1940-ft level are steadily advancing to complete a connection at that point.

ROCK ISLAND.—The prospecting drifts on the 650-ft level are also being steadily advanced, the ledge opening out finely.

BUCKETE.—Sinking the south winze below the 500-ft level is making good headway, the ledge gradually widening, and the prospects of pay ore are steadily increasing.

LADY WASHINGTON.—The shaft is being actively sunk 3 feet per day, with the bottom still in the very favorable vein material heretofore reported.

Arizona.

A ROAD TO BRANSHAW AND PECK DISTRICTS.—Arizona Miner, Dec. 17: The people here have been isolated from the outer world so long that it is hard to realize that we are about to be connected with the balance of mankind by rail, but it is true, nevertheless. Californians fooled themselves in many instances and thought it was only talk, that a railroad would be a long time in crossing the Sierras and Rocky mountains, but before they were aware it was accomplished and found many communities unprepared for it. What Prescott wants is a railroad passing through the country on or near the 35th parallel, which would pass to the north of us and compel the mines on the south to make this their depot of trade. This she may not get, and in that case she more than ever needs a wagon road to the mines to keep the trade from going the other way to a Southern railroad. The road already built to the Crook mill on the East Hassayampa is not first-class all the way, but it is susceptible of vast improvements, and from the mill to the Bully Bueno mine, we are told, by practical men, that a good road can be made at a moderate cost. From there on we are not posted as to the route, but money will build it, and should the county and village governments both go in debt to a large amount, it would be the best enterprise they could possibly engage in.

Utah.

RICH DISCOVERIES IN SOUTHERN UTAH.—Bounteous City correspondence Salt Lake Tribune: In addition to our climatic blessings, we have an abundance of rich silver mines, which your correspondent is now developing and bringing to the surface their rich chlorides and horn silver—all in sandstone, too. Prof. Maynard, our assayer, has carefully sampled some 10 tons of ore from the Tecumseh mine, which I am now shipping to your city. The assays are highly satisfactory, and will no doubt create a stir in mining circles, and will demonstrate a new phase in mining (in Utah at least), viz.: that rich silver ore can and does exist in sandstone. And why should it not as well in Utah as in South America and Sonora? Hundreds of miners have passed through this country, have seen the rich ores here, and because it was a sandstone country, and they had never seen silver mines in sandstone, they would rush on to Arizona and Nevada, leaving richer mines behind them than they could expect to find elsewhere. The developments here will remove to some extent the prejudices against a sandstone formation, for the silver and sandstone reefs of Southern Utah and Northern Arizona will soon be alive with the never contented prospector.

The artesian well Dr. Thornton is having bored on the ranch of Carr & Haggin, in Kern county, is now down to a depth of 420 feet, and without any indication of water.

The Llama and Alpaca.

Wegive on this page of the PRESS pictures of two ruminant animals which are agreeable and even attractive in appearance, are inoffensive in their habits and are useful to man.

The first, the llama, bears a strong resemblance to the camel, and is looked upon by naturalists as the representative of that animal on this hemisphere, being confined to South America. Their teeth are like those of the camel, but they have no humps upon their backs. The tail, which is not shown in our picture, is short and hairy; their toes are slender, the soles narrow and separated in front.

The animal which occupies the position of representative of its family in our illustration has a larger fleece than is found on the wild herds.

There are two distinct species found in South America—the *Llama vicuna* and the *Llama guanaco*. They both inhabit the Peruvian Alps, the Pampeas and the mountains of Chile, extending as far as the Straits of Magellan. The former animal, the vicuna, is principally found in the most elevated land and mountains of Bolivia and Chile. This species is quite wild, and is said to have defeated all attempts to domesticate it.

The guanaco is the characteristic quadruped of the plains of Patagonia, and is found in considerable numbers over the temperate parts of South America. They live in herds, but are said to be easily domesticated when once caught.

The wool of the llama is made into cords and a ske, and of these again are made various stuffs; and in Mexico the bones are converted into instruments for weaving the wool. But the European sheep is gradually taking the place of the llama, even in Peru.

The Alpaca.

The alpaca inhabits the more elevated ranges of South America, living almost on the borders of perpetual snow. The Peruvians keep vast flocks of them for their long, silky fleeces, which for instance rival that of the Angora goats. The "alpaca cloth," of the dry goods trade, is made of this material. It is principally used for woman's clothing; but it is now largely used for covering unwholesome. In texture it is finer and more durable than cotton, and is much cheaper than silk.

ALCOHOL IN GINGER BEER.—It will be startling and possibly painful intelligence to many of our "total abstinence" friends, that one of their favorite beverages, ginger-beer, is really a fermented liquor, and contains alcohol in proportions varying from two to five per cent. In a series of articles on "Modern Researches on Alcohol," now appearing in the *London Sanitary Record*, Dr. Bathurst Woodman says: "I should be very sorry to diminish the sale of ginger-beer, which I regard as one of the best of our summer beverages, containing, as it does, in almost all samples, either free citric or tartaric acid, or the almost equally beneficial bitartrate of potash. I have before me the recipes of several large makers, and take the first that comes to hand. It contains, besides ginger, tartaric and citric acids, 200 lbs. of sugar to 180 gallons of water. These ingredients are duly fermented, etc., and then bottled. Now, 200 lbs. of sugar (cane sugar) will produce in fermentation nearly 100 pints of alcohol; and, making all allowances for loss in yeast, by evaporation, in bottling, etc., it is quite plain that this liquor will contain about four per cent. of alcohol, and the result of actual experiment shows the same. The other recipes only differ in the amount of the saccharine substances, as regards the water, or the kind of sugar present, or the acid employed. This percentage of alcohol is, of course, about half the strength of most of the malt liquors in common use by the middle class of this country, but about equal to many of the cheaper ales, and to much of the beer drunk in Germany and other parts of the Continent."

THE INDUCED CURRENT.—"It appeared as if the current, on its first rush through the primary wire, sought a purchase in the secondary one, and, by a kind of kick, impelled backward through the latter an electric wave, which subsided as soon as the primary current was fully established."—*Tyndall*.

Lee District.

From J. R. Frink, superintendent of the Emigrant mining company, in the above district, we learn additional items of interest concerning the mines there. Lee district lies about fifteen miles north of Darwin, in a mineral belt of dolomite limestone about twelve miles in width, which is bounded on each side by a belt of quartzite. The dolomite formation is frequently overlapped with manganese lime rock, which latter is occasionally crossed by streaks of celadon, in which many cavities appear lined with beautiful crystallizations peculiar to such formations elsewhere. The uniform dip of the country rock is to the southward at a very slight angle of declination, but this is expected to change more to the perpendicular as depth is attained, where also the country rock will in all probability merge from limestone into porphyry, as has been proven by deep explorations in other mineral sections elsewhere. The ores of Lee district carry silver in the form of chlorides, black sulphurets and horn silver, with very little lead, copper, antimony or other base metals, and are unquestionably the easiest free milling ore yet found in California. The metal appears in the highest concentrated form, and is without doubt the richest ever discovered in this section, while the veins show croppings of extraordinary width and are very easily extracted.

The principal locations were made in February of this year, but much time has been taken in shipping ores for experimental tests to Germany, and the company working the principal mines has only of late got fully organized and prepared for operations. The mines

Mines at Howland's Flat.

A correspondent of the *Plumas National*, writing from Howland's flat, Sierra county, says: In its palmy days Howland flat was one of the liveliest mining towns in Sierra county. When the Pittsburg, Union, Down East and Monumental were in full blast, giving employment to hundreds of miners, there were flush times at Howland. Many thought those days would last forever. "Twas but an idle dream—bright while it lasted, but, alas, too short. When those claims were worked out, the unsettled, roving miner "folded his tent like the Arab, and silently stole away," to seek new scenes of pleasure, and hunt for pastures new. Then the greater portion of the town was destroyed by fire, as if some avenging Nemesis was determined that not a vestige of the once cozy little town should remain to mark where it once stood. Then Howland began to "go down." But "hope springs eternal in the human breast," and there were those who still believed that at no very distant day business would again be resumed, more new mines would be opened, and that fickle fortune would again deign to smile on their efforts. Those men, with every faith in its future, rebuilt their homes, and once more the town began to assume its wonted air of contentment and stability. Nor were they entirely to be disappointed. Their hopes of the good time coming were to be partially realized. The "open sesame" of capital, aided by energy and perseverance, came to the rescue, and new mines opened and developed. Foremost among these is the Empire mine, which to-day gives employment to nearly eighty men. The tunnel is

The Providence and Nevada Mines.

From a recent number of the *Nevada Transcript* we extract the following concerning these mines:

The present owners of the Providence mine, consisting of the Walrath Brothers, John Hunter and Col. Berry, came into possession, by purchase, four years ago. They have, during that time, been engaged in thoroughly prospecting and developing the mine. For purchase money, improvements and labor, their books show an expenditure of \$413,000, the greater part of which has been taken out of the mine while opening it. But little of the ground opened has been worked. It has been the plan of the owners to open the mine for future instead of present gain. Most of the rock worked by them has been taken out of the north side of the shaft, where the ledge averages from twelve to fifty feet in width. But during the past year the south side has been explored, and the ledge is found to be smaller and much richer. All the work done thus far on that side is what is called dead work.

The incline shaft is down 800 feet. On this level the shaft has been run seventy feet. On the 700-foot level the drift is in 260 feet, and the ledge is eight feet wide. On the 600-foot level the drift is in 500 feet, and the ledge four feet thick. On the 500 and 400-foot levels the drifts are in 245 feet; on the 300-foot 170 feet have been drifted; on the 200-foot 259 feet, and on the 100-foot 400 feet have been drifted. The winze on the 700-foot level is down fifty feet.

The 600 and 700-foot levels are connected by a winze which is 175 feet south of the incline. The winzes in the 500 and 600-foot levels are 245 feet from the incline. In short, the ledge for a depth of 800 feet on the south side, is ready for stopping, and for a distance of 500 feet, the point now reached with the longest drift, the rock is the best ever found in the mine. The ledge averages about six feet in thickness, and much of it is composed of fully ninety per cent. base metal. Prof. Price, who visited the mine recently, thought, judging by the weight of ordinary rock, that there are 25,000 tons of rock ready for stopping in sight. We believe double that quantity would be nearer correct.

The company have a fine mill of twenty stamps, with all the modern improvements for saving gold attached, besides extensive chlorination works, all of which they are going to abandon and have works for the Fryer process erected as soon as arrangements can be made.

The first work put up by Mr. Fryer will be upon the Providence, which will be between now and next May. Forty tons of the ore are now at the Fryer works for a test. We think it but justice here to state, that the present promising condition of the Providence is owing in a great measure to Mr. Thomas, the foreman. His services are appreciated by his employers, and they credit their success in mining to him. It will well repay any one to visit the mine and examine it thoroughly. It is, in our opinion the Cometock of California, and we think all who visit it will coincide with our opinion. The owners have displayed a spirit of enterprise and pluck worthy of a rich reward, and we are certain they have it in sight.

The Nevada or Soggs' mine, as it used to be called, is an extension on the north of the Providence. The mill and hoisting works are on the north side of Deer creek, opposite the works of the Providence. The ledge in the Nevada varies from three to sixteen feet in width and averages about six feet. There has been a great deal of work done on the mine, and large quantities of ore have been extracted, which paid well, but the mine has never been systematically developed as has its neighbor, the Providence, from the fact that the different owners have dared push ahead and take the chance of failure. We were shown some rock by Mr. William Berry, the superintendent, the other day, which is being taken out from the 200 foot level, that shows free gold in large quantities, and which pays \$80 to the ton. With a little outlay of capital and deep work, there is but little doubt the Nevada would prove a very valuable mine.

The British Admiralty has arranged for Capt. Allan Young to go to Smith's sound next year to communicate with the Arctic expedition.

The Los Angeles and Independence railroad will probably be extended to Anaheim.



LLAMA.

ALPACA.

owned by them embrace the Valentine, which is twenty feet in width, and crops out hold for a length of 3,000 feet. It courses like all the other veins yet found there, northeast by southwest, and dips to the north. The average assays from this mine were \$1,200 per ton in silver, which appears in the form of chlorides and sulphurets. The Cactus is an immense ledge which shows croppings sixty feet wide. Upon this an incline has been sunk forty feet in depth, and the ore produced is of the richest variety of horn silver and stetteldite, from which assays have been made as high as \$18,000 per ton in silver. This is a most extraordinary showing, but we are satisfied from specimens exhibited to us by Mr. Frink that the results are fully sustained by the appearance of the ore, the metallic luster of which is only excelled by the minted coin itself. Among the other locations of this class are the Centennial, Philadelphia and Capital, all of which show the same characteristics on the surface that were found in the Cactus, and all of which promise equally as fine prospects, which only require development to prove. The Mountain View is a distant claim, which carries ore of the copper-silver-glance variety, and upon it no work has yet been done. About thirty locations have so far been made in Lee district, and if a dozen of them prove to be of the same value as the Cactus the district will produce enough in five years' time to (in figurative language) pay off the National debt. In other words, we look for wonderful results to be obtained from Lee district.—*Coso Mining News*.

The fisheries at Mukilteo have all closed for the season. They did not prove as profitable as was expected, about 100 tons being the total catch.

WASHINGTON dispatches indicate the probability of an Indian war in the Northwest this winter.

MUCH trouble is experienced at present in procuring sailors at the ports on Puget sound.

a monument of engineering skill. After running over 3,000 feet, part of the way through hard blasting rock and still harder cement, they tapped the pay channel and the Empire was a success. From the beginning of the work until the first load of pay-grit was dumped in the washing shed, this enterprise cost nearly \$8,000. Nor was the company, under the able and efficient management of the superintendent, Mr. J. P. De Noon, satisfied until all the appliances for washing, flumes, pipes, etc., were neatly and conveniently arranged. In fact, the Empire is to-day the model mine of Sierra county, and so far as the richness of the gravel is concerned, it pays more, man for man and load for load, than the Bald Mountain at Forest City. At present Mr. Geo. Reobley is day-foreman, and Robert Patterson night-foreman. Both are good, practical miners, and well liked by the boys. Another company, the Virginia, is running for the same channel, but it will be some time before they get into pay.

Down to the Grove there are two companies at work in hydraulic claims, the Comet and Cox Brothers. In the spring the Last Chance company propose to take a chance. Those companies are making their mines "ante," and as the indications are good for a first-rate water season, we shall hear of some large "clean-ups."

COPPER IN INYO.—The *Inyo Independent* says: Among other important enterprises likely soon to add to the fame and wealth of Inyo county is the proposed workings of the immense copper ledge in Ubebebe district, to which we have frequently alluded heretofore. This ledge is a monster; its ores being carbonate, no difficulty is apprehended as to their profitable reduction by a furnace similar to that used for silver lead. Mr. Belschw, who has purchased the property from Messrs. Hunter and Porter, intends to locate his furnace in the edge of Salinas valley, some twenty miles east of Cerro Gordo, and within easy reach of the mines, this work to be undertaken on or before early spring.

USEFUL INFORMATION.

WILL HUMAN SALIVA KILL SNAKES?—The Merietta (Ga.) Journal was told by a gentleman the other day that human spittle was as deadly to poisonous snakes as their bites were deadly to man. He says while picking up a bundle of straw and trash under his arm, while cleaning a field, a ground rattlesnake, four feet long, crawled out from it and fell to the ground at his feet. He at once placed his heel upon the head of the snake and spit in its mouth. Shortly afterward the snake showed symptoms of inactivity and sickness, and he picked it up by its tail and carried it to the house and showed it to his wife, telling her he had spit in its mouth and that it was poisoned. At the expiration of fifteen minutes the snake was dead. To further experiment he came across a blowing adder (snake), which ejected from its mouth a yellowish liquid. He caught it and spit in its mouth, and it died. He caught another blowing, and it refused to open its mouth. He spit upon a stick and rubbed the spittle upon the adder's nose, and it died. Afterward he came across a black snake, regarded as not poisonous, and he caught it and spit in its mouth. Instead of the spittle killing the black snake, as it did the poisonous reptiles, it only made it stupidly sick, from which it recovered. This conclusively shows that poisonous snakes have as much to fear from the spittle of man as man has to fear from their bites.

HOW FAR WILL BEES GO FOR HONEY?—This is a question which has never been satisfactorily answered. A bee-keeper once tried the old experiment of dusting his bees with flour as they left the hive, then rode to a health seven miles away, where he discovered his white bees most busily collecting honey; however, this experiment cannot be relied upon, for the simple reason that pollen, with which bees are often completely covered, bears a general resemblance to flour, and might be mistaken in color when the bees are on the wing. We think they seldom venture more than three miles from home, for we have known them to be in a starving condition when another apiary four miles away was flourishing, and gathering stores rapidly. It has in recent years been proved by Italian hybrids that queens have met with drones which were known to be at least three miles away, but this will scarcely apply to worker bees flitting about from flower to flower; they must become weary before they are three or four miles from their home.

GOLD.—The New York Mercantile Journal says that in view of the small amount of gold in the world in proportion to the increased amount of commerce, the efforts to regulate exchanges and pay balances in gold is as fruitless as to endeavor to quench the thirst of an elephant from a tea saucer. Within the past year over \$60,000,000 worth of gold have been shipped from the port of New York, and about half as much more from San Francisco. This country is sending to Europe annually about \$250,000,000 in gold for interest on national and state bonds held there, and for the balance against us for gew-gaws and delicacies we do not need, and for the traveling and living expenses of our snobs who go there and spend their money because this country is too much of a democracy for them.

COLORING OAK WOOD.—According to Niedling, a beautiful orange-yellow tone, much admired in a chest at the Vienna Exhibition, may be imparted to oak wood by rubbing it in a warm room with a certain mixture until it acquires a dull polish, and then coating it after an hour with a thin polish, and repeating the coating of polish to improve the depth and brilliancy of the tone. The ingredients for the rubbing mixture are about three ounces of tallow, three-fourths ounce of wax and one pint of oil of turpentine, mixed by heating together and stirring.—*English Mechanic.*

BURNING OF A TIRE.—One of those accidents, not very common but still well known and understood, of the bursting of a locomotive tire, recently occurred near Oakes station, Penn., on the Perkiomen railroad. It was a steel tire, and the accident occurred while the train was in slow motion, just nearing the station. The tire first struck the foot board, near where the engineer stood, broke it into a thousand splinters, and next bounded thirty feet into the air, and came down in a field more than a hundred yards distant.

THE USE OF IODINE.—The objection which many persons urge against using tincture of iodine on the skin is, that the stain is ineradicable, except after considerable time. If a few drops of carbolic acid be added to the tincture, says a medical journal, it will not stain; moreover, the tincture itself is more efficacious.

FOR SMOKING GRATES, ETC.—A screen or blower of wire gauze, from thirty-six to forty wires to the inch, placed in front of range or stove fires, or grate, will prevent, it is said, smoke coming into the room when the chimney fails to draw well.

A POTATO PARSER is among the latest inventions, which, it is claimed, will pare perfectly, long, crooked, unevenly shaped potatoes with a great saving of time, and a large saving of the potato over ordinary hand paring. It also pares turnips or apples.

A PROPOSED INSECT COMMISSION.—A memorial was submitted to the meeting and approved, which addresses Congress with relation to the establishment of a national insect commission. The document states that the damage done by the noxious insects in the United States amounts to \$300,000,000 per annum. The subscribers propose either the reorganization of the Department of Agriculture, under the control of the highest scientific authorities, or the appointment of a commission of five persons, to wit: Three entomologists, one chemist, and one botanist, eminent in their respective branches of science, to be chosen by the council of the National Academy of Science, and approved by the secretary of the treasury, with salaries adequate for the responsible work. The duty of this commission would be to investigate the causes which affect injuriously agricultural interests, and to suggest the best means of diminishing the losses. The results of such investigations should be embodied in brief reports, containing practical instructions and made accessible at a small price; or the results should be made useful, by personal education, to every farmer in the country.

AN ALLOY OF COPPER ADHERENT TO GLASS.—An alloy of copper which will adhere to glass or porcelain is made by mixing from twenty to thirty parts of copper in powder, (obtained by the reduction of the oxide by hydrogen or by the precipitation of the sulphate by zinc) with sulphuric acid and then with seven parts of mercury. The mixture is triturated and mingled with care. The acid is removed by washing in hot water, and the mass allowed to dry. At the end of ten or twelve hours, the latter becomes quite hard and susceptible to a fine polish. On heating it softens, but on cooling does not contract. This alloy may also be used for joining delicate objects which will not withstand very high temperatures.

LAMP CHIMNEYS.—Most people in cleaning lamp chimneys use a brush made of bristles twisted into a wire, or a rag on the point of scissors. Both of these are bad; for without great care the wire or scissors will scratch the glass as a diamond does, which under the expansive power of heat soon breaks, as all scratched glass will. If you want a neat little thing that costs nothing, and will save half your glass, tie a piece of soft sponge the size of your chimney to a pine stick.

TO DEODORIZE COCONUT OIL.—Mix with 1.32 parts freshly prepared bone black and 1.32 parts calcined magnesia, digest for three days, shaking frequently; let stand till clear and filter.

GOOD HEALTH.

Origin of the Water Cure.

The water cure, or hydropathy, owes its origin to the fertility of invention of a Silesian peasant, Vincenz Priessnitz. Having at the age of thirteen sprained his wrist, young Priessnitz intuitively applied it to the pump; and afterward, to continue the relief thus obtained, he bound upon it a wet bandage. Retaining this as it became dry, he reduced the inflammation, but excited a rash on the surface of the part. Soon after, having crushed his thumb, he again applied the bandage, and the pain once more subsided, but the rash reappeared. He inferred that the rash indicated an impure blood; and this conclusion was strengthened by the result of experiments which he was induced to try upon injuries and ulcers in the case of some of his neighbors, since the rash in some instances appeared after the treatment, and in others did not. Thus he was led to frame for himself a humoral pathology of all diseases, and a doctrine of the elimination of morbid matter by "crisis." According to this view, the cure of disease is to be effected by favoring the activity of those organs through which the purification of the system is carried on, and, through a regulated and pure dietary and correct regimen, preventing further morbid accumulations. In his nineteenth year, being run over by a cart, Priessnitz had some ribs broken and received severe bruises; on learning that the physicians pronounced his case hopeless, he tore off their bandages, and recovered under the renewed application of the wet bandage, and replaced his ribs by inflating the lungs while pressing the abdomen against a window sill. This incident confirmed the idea and initiated the practice of the water cure.

A PRACTICAL TEST.—A correspondent sends us the following, which shows the importance of a close examination of our health columns: "A subscriber not at all interested in your 'split bean' remedy when she read it, soon found occasion to do something for a rough nail puncture which was very painful; and was perfectly astonished at the speedy relief, quick and painless healing. Her faith is now strong in that remedy." This fact illustrates a whole class of experience, and shows the utility of knowledge and facts in store for the moment when some emergency will prove their value. Some do not read the health column because they are not then needing such information, but when they do need that knowledge they have not time or opportunity; similarly excused as was the Arkansas farmer for not roofing his house.

The Effect of a Diseased Liver.

A healthy liver secretes each day about two and a half pounds of bile, which contains a great amount of waste material taken from the blood. When the liver becomes torpid or congested, it fails to eliminate this vast amount of noxious substance, which, therefore, remains to poison the blood and be conveyed to every part of the system. What must be the condition of the blood when it is receiving and retaining each day two and a half pounds of poison? Nature tries to work off this poison through other channels and organs—the kidneys, lungs, skin, etc., but these organs become overtaxed in performing this labor, in addition to their natural functions, and cannot long withstand the pressure, but become variously diseased.

The brain, which is the great electrical center of all vitality, is nudly stimulated by the unhealthy blood which passes to it from the heart, and it fails to perform its office healthfully. Hence the symptoms of bile poisoning, which are dullness, headache, incapacity to keep the mind on any subject, impairment of memory, dizziness, sleepy or nervous feelings, gloomy forebodings and irritability of temper. The blood itself being diseased, as it forms the sweat upon the surface of the skin, is so irritating and poisonous that it produces discolored brown spots, pimples, blotches and eruptions, sores, boils, carbuncles and scrofulous tumors. The stomach, bowels and other organs spoken of, cannot escape becoming affected, sooner or later, and costiveness, piles, dropsy, dyspepsia, diarrhoea, female weakness and many other forms of chronic disease are among the necessary results.

Tape Worms.

The origin of tape worms is the eating of measly pork, which has not been sufficiently cooked to destroy the germ. It may also be communicated to beef by the knife of the butcher, should he cut pork and beef with the same knife. The germ adheres to the interior of the human intestines, soon becomes the head of the tape worm, and then the links grow, each of which eats and digests independently of the head.

To remove it, a large oose of Rochelle salts is given at night; at ten o'clock in the morning a dose is given made of one-half ounce of bark of pomegranate root, one-half drachm pumpkin seed, one drachm ethereal extract of male fern, one-half drachm powdered ergot, two drachms powdered gum arabic, and two drops of croton oil. The pomegranate bark and pumpkin seed are to be thoroughly bruised and, with the ergot, boiled in eight ounces of water for fifteen minutes, then strained through a coarse cloth. The croton oil is first well rubbed up with the acacia and extract of male fern, and then formed into an emulsion with the decoction. In each case the tape worm will be expelled alive and entire within two hours.

The above prescription is from the *Druggist's Circular*, and is similar to the old established method; but a recent publication informs us that where this has failed, the tape worm was effectively driven out by means of diluted carbolic acid, which is a poison for all small animals and inferior forms of life.

NEW MODE OF ADMINISTERING RAW MEAT.—M. Laborde, in a French medical journal, recommends the following method for the preparation of raw meat: Make a not very thick broth of tapioca, and let it cool. The meat, finely scraped, is diluted with a quantity of cold soup, with which it is thoroughly mixed until it looks like tomato soup. The tapioca is then turned in, little by little, with constant stirring. A homogeneous liquid is thus obtained, in which, when properly made, the meat is so thoroughly disguised that the person eating it does not suspect its presence. The preparation has been often given under the name of "medicinal porridge of tapioca," and has proved very acceptable to the patients.

USEFUL APPLICATION OF THE DOG'S STRONG DIGESTION.—The daily papers announce the following item: "A Hartford man recently got a piece of tough meat lodged in the lower part of the esophagus, making breathing difficult and threatening inflammation, and was treated by Dr. Ellsworth of that city, who killed a number of dogs, and with the gastric juice of their stomach coatings, succeeded in dissolving the piece in the course of the day." As no animal has a stronger digestion for bones and tough meat than the dog, its gastric juice being very powerful, it was a happy idea of Dr. Ellsworth to employ this for the solution of the difficulty.

DYSPEPTIC HUNGER.—If a man is hungry within an hour, more or less, after a regular meal, he is dyspeptic beyond question, and it shows that the stomach is not able to work what he has eaten, so as to get nourishment out of it; but to eat again, and thus impose more work, when it could do nothing for what had already been eaten, is an absurdity; and yet all dyspeptics who eat when they are hungry do this very thing, and thus aggravate and protract their sufferings.

SICK HEADACHE.—Two teaspoonfuls of finely powdered charcoal, drank in a half tumbler of water, will often give relief to the sick headache when caused, as in most cases it is, by a superabundance of acid in the stomach.

DOMESTIC ECONOMY.

How to Carve and Help at Table.

It is considered an accomplishment for a person to know how to carve well at his or her own table. It is not proper to stand in carving. The carving knife should be sharp and thin.

To carve fowls (which should always be laid with the breast uppermost,) place the fork in the breast and take off the wings and the legs without turning the fowl; then cut out the merry thought, cut slices from the breast, take out the collar bone, cut off the side pieces and then cut the carcass in two. Divide the joints in the leg of a turkey.

In carving a sirloin cut thin slices from the side next to yon (it must be put on the dish with the tenderloin underneath), then turn it end out from the tenderloin. Help the guests to both kinds.

In carving a leg of mutton or ham, begin by cutting across the middle to the bone. Cut a tongue across, and not lengthwise, and help from the middle.

Carve a forequarter of lamb by separating the shoulder from the ribs, and then divide the ribs.

To carve a loin of veal begin at the smaller end and separate the ribs. Help each one to a piece of kidney and its fat. Carve pork and mutton in the same way.

To carve a fillet of veal begin at the top, and help to the stuffing with each slice. In a breast of veal separate the breast end brisket, and then cut them up, asking which part is preferred.

In carving a pig it is customary to divide it and take off the head before it comes to the table, as to many persons the head is revolting. Cut off the limbs and divide the ribs.

In carving venison make a deep incision down to the bone to let out the juices, and turn the broad end toward you, cutting deep, in thin slices.

For a saddle of venison cut from the tail toward the other end, on each side, in thin slices. Warm plates are very necessary with venison end mutton, and in winter are desirable for all meats.—*National Agriculturist.*

TO MAKE DUTCH CHEESE.—The domestic article made of sour milk, often known as "Dutch cheese" or "pot cheese," is prepared in the following way: "Set the vessel containing the sour milk on the stove over a kettle of water, and let it heat up slowly till the milk thickens and the whey is partly separated. As soon as the curd becomes firm enough to handle (before it becomes hard and the whey all separated) it is removed and suspended in a cloth or perforated tin long enough to drain off the whey and cool. If for domestic use, it is broken up, and about half as much sweet cream added as originally belonged to the milk, and salted and otherwise seasoned to taste with some aromatic, if desired, and either made into hand cakes or packed away in a vessel for use. If for market, the curd is drained and broken up, and salted and seasoned with a little pepper or caraway seed, and a little butter added, so that the particles of curd will adhere, and then molded by hand into four-ounce cakes or cheeses and placed at once upon the market, where a ready sale is usually found at remunerative prices. The original German practice was to place the hand cheese as above made between layers of straw, and let them lie till cured, so as to develop some of the Limburger flavor. But the general practice in America is to use them while fresh.

BREADEN TOMATOES.—Cut off the tops of twelve ripe tomatoes, scoop out the seeds, set them in a pan with one gill of salad, and fill with the following preparation: One-half pint of mushrooms, one handful of parsley, four shallots, two ounces of fat bacon and two ounces of lean ham, all chopped fine and seasoned with a little thyme, pepper and salt; heat this mixture over the fire five minutes, take it off and stir in the yolks of four eggs; fill the tomatoes, cover them well with browned bread crumbs, cook in a hot oven fifteen minutes and serve with or without Italian sauce.

DRESSED MUTTON.—To have it as it should be, the dish must be lined with mashed potatoes, the mutton nicely minced and properly seasoned, placed in a dish, a little stock added, and then covered over with mashed potatoes roughed with a fork, and placed before the fire till the little dish assumes the appearance of a nicely baked hedgehog. The hotter served the better relished, provided it has only been allowed to simmer and not to boil.

"What shall I cook?" is a short but vexatious question, engrossing more serious thought, probably, than any other one question in the world. Many a good and industrious wife can be greatly relieved, and many a farmer's table blessed his sight and appetite, by providing now for a good garden. If you love your wife and daughters do not put it off for money making enterprises on the farm.

STEWED POTATOES.—Take cold boiled potatoes, pare them and cut in thin slices; to a pint of milk, when scalding hot, stir in a tablespoonful of butter and flour, rubbed together; salt to taste; add the yolk of one egg and some parsley chopped fine. When well mixed, throw in the potatoes, shaking carefully without a spoon to avoid breaking. Let them stew for a few moments and serve.



W. B. EWER.....SENIOR EDITOR.

DEWEY & CO., Publishers.
A. T. DEWEY, GEO. H. STRONG
W. B. EWER, JNO. L. BOONE

Office, No. 224 Sansome St., S. E. Corner
of California St., San Francisco.

Subscription and Advertising Rates:

ADVERTISING RATES.—1 week. 1 month. 3 months. 1 year.	Per line.....	25	80	\$2.00	\$5.00
One-half inch.....	\$1.00	3.00	7.50	24.00	
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THE ORIGINAL ARTICLES in this paper are mostly set in solid type, giving in our columns one-third more reading than is contained in ordinary leaded matter.

San Francisco:

Saturday Morning, Jan 1, 1875.

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Stitched and Trimmed for the Good of Our Patrons.

Our readers will receive this first number of the Press for 1876 stitched and trimmed, ready for reading upon whichever page they choose first, without let or hindrance. This feature will be one of the improvements promised in our sheet for the New Year which we hope our readers will fully appreciate. It will be a real convenience to them at least fifty-two times during 1876. The present age calls for time saving expedients. This is one of them. It trims up the avenues to our advertising as well as reading pages, and thereby is an important benefit to our advertisers as well as subscribers. It nearly doubles the value of our advertising pages, but we shall not raise accordingly on our rates; neither shall we allow new advertisers to override our reading columns if we have ever so great a rush.

Large folding and pasting machines are expensive. In the principal Eastern cities, a dozen or more journals are often printed in a single job office. In such cases, one folding and pasting machine may do the work of all at a comparatively small cost to each, but on this coast we can have no such co-operative opportunities, and we have to accomplish the new work exhibited to our readers to-day single handed.

If this first week every copy is not finished as perfectly as desired, we will try and do the work better with each succeeding issue. Although somewhat expensive to the publishers, we believe the improvement will be well appreciated by our readers, whom we invite assist us in extending the circulation of the Press.

Mining Terms.

We wish that some intelligent person familiar with the Comstock would compile a vocabulary of mining terms used in that section, as they differ in some respects from those used in other places, many being peculiar to the district. In many cases, terms which elsewhere mean one thing, mean something quite different on the Comstock, their adoption having been made by common custom. Numerous instances of this might be cited, but a single one of recent occurrence will be sufficient.

In the annual report of the Ophir mine the superintendent says: "The prospecting on the lowest level (1700 foot) discloses in the west cross-cuts a great disturbance of the west wall of the lode, and the eastern cross-cuts, as far as they have penetrated, have passed through 'horses' or masses of west country, and entered more favorable formation with 'stratums' of low grade ore following out east, which evinces a 'heave' or pushing of the ore vein, and gives hopes of discovery of ore deposits on this level further east."

We did not understand the superintendent's expression of "passing through horses or masses of west country," and asked several old miners familiar with the Comstock who couldn't understand it either; so we have examined what works of reference we have at hand, to see the correct definition of both 'horse' and 'heave,' used, as we think, incorrectly in the above paragraph.

In Foster & Whitney's glossary of mining and metallurgical terms, in their government "Report on the Geology and Topography of Lake Superior Land District," (1850), a "heave" is defined as "the horizontal dislocation which occurs when one lode is intersected by another having a different direction."

Von Cotta's "Treatise on Ore Deposits" defines the term heave as "that sometimes applied to horizontal dislocation which occurs when one lode is intersected by another; a slide is a vertical dislocation of a lode."

Page's "Hand Book of Geological Terms" defines heave as "the displacement of a vein or bed by the intersection of another vein or fault. When the intersected vein is thrown up it is said to be a 'heave,' and when thrown down a 'slide.'" Heave and slide are thus merely relative terms according to the position from which they are viewed.

In the "Student's Manual of Geology," by J. Beete Jukes, "horse" is a term commonly applied by vein miners to any large, detached mass of rock occurring in a vein or lying between two branches of a vein. In Foster & Whitney's glossary, it is defined as "the dead ground between two branches of a lode."

Wear of Wire Rope.

The directors of the Clay street hill railroad recently removed the old wire rope which has been in use for some two years and substituted a new one. The road runs up Clay street hill, and the cars are propelled by an endless wire rope passing up one side of the street and down the other, underground. The engine furnishing the power is at the upper end of the line. The old rope was 7,000 feet long, three inches in circumference, and made of 114 steel wires of No. 16 gauge. It was put in use August 22d, 1873, and was in use two years, three months and twenty days when removed. It was made to work seventeen hours a day while running. During this time it carried 3,300,000 passengers.

A few deductions showing the amount of work obtained from this rope will be of interest. The 3,300,000 at an average of 150 pounds apiece would give 495,000,000 pounds. Eight cars go up twenty-five times a day for 840 days, giving 705,600,000 pounds. Adding the weight of the cars to passengers it gives 1,200,600,000 pounds, or 600,300 tons, raised 307 feet vertically in a distance of 3,300 feet in 840 days, working seventeen hours a day. The result is, we get 1,200,600,000 pounds raised 307 feet in 856,800 minutes. This rope traveled 64,260 miles, or more than equal to two and a half times the distance around the globe.

While this rope was running it stretched about one per cent., or 70 feet on the 7,000. It was reduced in circumference about seven-thirty-seconds of an inch. The consumption of coal by the engine to perform this work was about 1,500 pounds of Wellington screenings per day, at \$9 per ton. From experiments made at the station it was found that it took six pounds of steam to keep the rope running (unloaded) after it was started. It took twelve pounds to overcome the inertia and friction. The cylinder of the engine is twelve by twenty-four inches. This ropeshow is a pretty good record and shows what wire rope will do. It was made by A. S. Hallidie, of this city, from imported steel wire. The changing of the ropes took thirteen hours. The rope shows little signs of wear and would probably last a year or more longer with safety, but the directors thought best to take all precautions and change in time.

The new rope is 7,000 feet long and weighs 10,800 pounds. It is the same that was on exhibition at the late Mechanics' Institute Fair. It is made of fine steel wire, hardened and tempered, No. 16 gauge. There are 114 steel wires and nineteen soft iron wires for the heart. The rope is three inches in circumference, and was made at Hallidie's factory, in this city.

As a matter of record we may also mention the data obtained for a rope in use at the Crown Point mine on the Comstock. Mr. Hallidie has a statement up to the 6th of November. The steel rope was set at work August 1st, 1874, on the incline. The rope is 2,650 feet long, 6 1/4 inches in circumference and weighs 17,237 pounds. Up to the date mentioned it had worked 10,928 hours, and hoisted 209,592 tons. It runs at a speed of 670 feet per minute. Total weight of each lift 34,000 lbs.; vertical distance 1,500 feet. This gives 209,592 tons raised 1,500 feet in 10,928 hours. The rope is still at work and in good order. The record of these ropes speaks well for our California manufacturers.

The Gould & Curry Mine.

The annual meeting of the Gould & Curry mine was held this week. Mr. James G. Fair, the superintendent, in his annual report says that in the previous annual report he recommended that two additional compartments of the main shaft be sunk from the 1200-foot to the 1500-foot level, and that during the year the work was done, doubling their hoisting capacity as well as bettering the ventilation of the mine. Work on the shaft between the 1500-ft level and the surface had been continuous throughout the twelvemonth. Notwithstanding this work the shaft is now in bad condition and extremely dangerous—the swelling ground crushes in the timbers and is a constant source of delay and expense, and Mr. Fair recommends a stoppage of work for a short time and a substantial retimbering of the four compartments of the shaft, from the 1500-foot to the fifth levels. This can be done at the same time work in the mine is carried on, but, in the superintendent's opinion, the cost by this method would be doubled and the work would not be as substantial as it would be were all other work stopped. The year has shown a material increase in the flow of water in the mine, three-quarters of it coming from the east side of the shaft over the 1500-ft level. All of the eight-inch pumps have been removed within the year, and a twelve-inch pump substituted, but even with this increased capacity he was unable to keep the mine free from water below the 1600-foot level. The moving of the timbers in the shaft displaces pumps and pump-rods, causing stoppages constantly and the accumulation of water, which can only be remedied by a thorough retimbering of the shaft. On the 1700-foot level the main drift has been extended to the northern boundary and connected with the Best & Belcher joint winze sunk from the 1500-ft level, which secured a good ventilation. The east drift on this level has been run east from the incline 1,033 feet to the east wall of the vein, but as it showed strong indications of water, and as the pumps were already working to their full capacity, it was deemed best not to cut into the vein. No cross-cuts have yet been made on this level, and its value, therefore, has not been ascertained. The formations passed through by lateral drifts look favorable and assay from \$5 to \$20 per ton, but all the work done so far is outside the ore vein. The winze sunk 182 feet below the 1700-ft level, designed to connect with the 2000-ft level of the Savage, is now filled with water. The 1500-ft level has been thoroughly developed by cross-cuts in all parts, but no ore of value has been discovered. Much work has been done on the levels above in prospecting new levels and repairing and extending old ones, but all have failed to disclose ore of value. It is evident, says the superintendent in concluding his report, that the company must look to the 1700 ft level and further depths for the production of ores. Buildings, engines and machinery are in excellent order, and there are good supplies of timber and materials on hand for the winter.

The following is a synopsis of the secretary's report: Receipts during the fiscal year amounted to \$339,399—of which \$97,648 were from an assessment, \$222,749 from the sale of 12,000 shares of stock, and \$18,466 from various other sources. Disbursements amounted to \$328,377, leaving as cash on hand at the close \$11,022. Of the disbursements \$280,348 was for labor, \$4,090 for a sluice tunnel, \$3,503 for legal expenses, \$1,174 for exchange, \$22,972 for general expenses, \$3,766 for interest, \$1,752 for taxes, and \$29.84 for minor items.

The following Trustees were elected: Edward Barron (President), George Congdon (Vice President), James G. Fair (Superintendent), James C. Flood, William S. Lyle, Robert Sherwood and R. H. Follis.

A NEW VOLUME.—With this number the MINING AND SCIENTIFIC PRESS commences volume XXII, and while wishing our many readers a very Happy New Year, we take occasion at the same time to suggest that it is a very proper time to renew subscriptions about to expire. We have endeavored during the past year to make as interesting and valuable a paper to miners, mechanics and other industrial readers as possible, and flatter ourselves that we have succeeded very well. The Press has now attained a ripe age and its usefulness has increased with its years. No miner or manufacturer can afford to be without the representative industrial publication of the Pacific coast. We shall in the future, as in the past, look out for everything of interest or benefit to our patrons, and only need from them their co-operation and support to continue to maintain a paper worthy of the interests it represents.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of mention:

FRICTION PULLEY.—Alfred Swiggle, S. F. This invention relates to a novel construction of a friction pulley, and consists of a pulley mounted to turn loosely upon a shaft, which has a disk, moving longitudinally upon a feather, so that by means of a sort of double knee lever, or toggle, the face of the disk can be moved closely against the side of the pulley, and by its friction cause the two to move together as one. These knee levers are operated by a sliding clutch, and are made to stand at a small angle between the disk and the bar against which they act, so that when the strain comes upon the pulley it will tend to bind the flange closer to it. This provides a frictional device for driving loose pulleys.

REVERSIBLE PINION FOR WATCHES.—Frank E. Smith, S. F. This is an improved method of attaching the center wheel pinions of watches to the arbors or shafts of the center wheels, in order to allow the pinion to turn in a reverse direction, and relieve the strain upon the mechanism of the watch in case the mainspring should break. This arrangement is very simple and can be cheaply applied, while it does not encumber the pinion with outside attachments, which are at the same time complicated and unsightly in a watch.

IMPROVEMENT IN RAILWAY CARS.—Joseph Bolt, Benicia, Cal. This invention is intended particularly for the transportation of troops and second class passengers on railways, but may be also used for first class passenger cars. The improvements consist in certain arrangements which make the cars convenient for day and night travel, so that provision is made for sleeping at night as well as for seats by day. The inventor takes the ordinary seats for four persons. In order to accommodate these persons in a recumbent position at night it will be necessary to convert the surface into a continuous surface or bed for two, while the space above will be occupied by another mattress or bed for two more persons. In the special device used for this purpose by Mr. Bolt the seat frames are arranged to slide a short distance forward or back. To the edges of each seat nearest the ends of the sections are hinged extension pieces. These pieces are folded beneath the seat in the day time, but at night are allowed to rest on a supporting ledge at the ends of the sections, forming a continuation of the seat, and serve as a part of the bed. The arms of the seats are pivoted, so that they may be reversed in the usual manner. The links connecting the seat back with the arms of the seat are made double, so as to be extended or shortened, and by this arrangement the inventor is able to lay the back of one seat horizontally, so as to fill the space between that seat and the one behind it. The back of the other seat is not disturbed, but serves as a head board for the bed. The upper berth is hung upon hooks, so as to be swung up close to the roof during the day. The improvements made by Mr. Bolt also include racks for guns, etc. These racks are arranged in a series of four, attached to the side of the car above each two seats of the section. They are made so as to suit any size of gun that may be carried by the troops.

MAP OF CALIFORNIA.—Whitney's geological survey map of California has been revised by Messrs. Hoffman & Craven, and issued in a perfect manner for the benefit of such of our citizens as wish a correct map of its size and at a moderate cost. Mr. E. M. Sleater, the agent, is selling the last of the limited edition printed at the reduced price of \$3.50, instead of \$5, for copies mounted on cloth and rollers. Since the first edition was issued, the counties of San Benito and Modoc have been organized; Klamath has been extinguished, and the lines of Butte, Colusa, Los Angeles, Inyo, San Bernardino, Tulare, Fresno, Santa Barbara, San Luis Obispo, Monterey, Siskiyou, Humboldt, Nevada and Sierra have been changed. The extensions of the railroad to Bakersfield, Spadra and San Fernando, and the routes of the road to Monterey, Santa Cruz, Marin and Amador are shown. New towns are also put down. The State of Nevada is included, and additions are there made. The scale of this, as of the first edition, is eighteen miles to one inch.

BALL'S DREDGE.—Mr. John A. Ball has a communication in another column giving a brief history of his experiments with his dredging apparatus, which was recently described in these columns. Mr. Ball is a painstaking inventor who has overcome many serious obstacles heretofore and is hard at work removing others. His machine is well worthy of a critical examination by those interested in mechanical contrivances, as well as by those for whose benefit it is to work. There are many novel points in its construction, and as far as we can see it does the work it is intended to do very well. Mr. Ball is an active, intelligent man, enthusiastic on the subject to which he has directed his attention, and is worthy of success, which he will, no doubt, ultimately achieve.

Ball's Sweeping Dredge.

Many of the readers of your valuable paper, I believe, will read with interest a statement from myself, relative to my enterprise, namely, the Ball sweeping dredge. I desire to place before the public some outline of what I am aiming to accomplish, which is no small matter to the interests of our State and country.

In the summer of 1862 I crossed the plains and settled in Nevada county, where, under adverse circumstances, I accomplished but little, until I came to Oakland about three years ago. While living in Nevada county I traveled some in the great valleys of this State and became awakened to the importance of a general system of irrigation. Having seen what irrigation had done for the poor desert land of the Mormons, I saw how much more favorable were the conditions as to the soil, climate and supply of water for irrigating the great valleys of California, if a grand systematic plan could be had to provide water for all the land possible. At that time I predicted that sooner or

capals and building reservoirs, therefore waded to see that if I could successfully introduce steam machinery for doing such work, I would do much to advance the project, also better my own circumstances.

About ten years ago I invented the main principles of my improvements in dredging and excavating machinery, and during all these years, although in a helpless condition, I have been centering all my energies to accomplish the one object, namely, to get into practical use steam machinery for digging canals. But while thus engaged, an opportunity was presented which enabled me to experiment by attaching my improvements to a dredging machine first. I have made many radical changes from any other dredging machine yet in use, and still I find opportunity for improvements. The results thus far attained, I mean in regard to dredging into scows, then towing to deep water and dumping, assure me that no other machinery now in use can successfully compete with mine. I think the dumping practice is wrong, and believe the taking of the material dredged from under water on the shore is a great necessity; and that by adding to my improvements already made, I shall successfully provide the machinery for that purpose

especially those interested in excavating or dredging, to examine the machine now at work along the water front, San Francisco, where can be seen whether I have any reasonable grounds for supposing that such machinery would dig the canals successfully, with speed and at a cheaper rate than by any other means.

The work that has been done for some time past has averaged over 1,500 cubic yards per day of six and a half hours.

About one-half of the time the dredger lies idle for want of the scows being towed away as fast as they are filled, as no one tug can tow the scows away as fast as they are filled. The average time of filling each scow of 105 cubic yards is less than twelve minutes. I am prepared now to do dredging for less than forty per cent. of the prices heretofore existing in this State, and I feel sure that when I have more fully perfected my machinery I shall be able to dig and transfer earth from one place to another, in nearly every case of requirement, for one-tenth of the present cost by the means heretofore used, and also to facilitate such work in proportion that steam power does in the many other uses, as in manufacturing, etc. Therefore, I am hoping to assist in the more rapid development of our country, by aiding

material struggles in which we have triumphed, and the foes of civilization which have been put to flight. Upon the right of the picture the light of a good day of enlightenment shines upon our favored coast. It is the light which we now enjoy.

To us in this day the glorious facts which are suggested by this engraving seem grand accomplishments. But there is a future still beyond, and those who, in that day of even greater things, shall look upon these marks of progress which so delight our thought, may think them small indeed. But thus it is ever-onward.

Gravel Mining on "the Ridge."

The Ridge, as the gravel range of Nevada and Sierra counties is called, is now yielding largely in gold. From Gold Lake, Sierra City, Downieville, Forest City, Monte Cristo, Eureka, Brandy Flat, Indian Hill, Comptonville, Moore's and Woolsey's flats, North Bloomfield, Columbia Hill, Cherokee, San Juan, Sweetland, French Corral and Nevada City to Grass Valley, are all now furnishing their share of bullion. Many



AMERICAN PROGRESS.

later the subject would become a political issue, and a State general system of canals for irrigation, transportation and water for the cities that were to grow, would be accomplished. I would like to dwell more particularly on this point, with reference to some of the causes that have thus far retarded the State government from advancing the subject of its greatest interest—the allowing individuals and incorporated companies to get possession of the water rights and large tracts of land through the various ways of intrigue in which they successfully have operated, thereby placing as it were a complete nightmare on the prosperity of our State, shutting out the poor man from opportunities to till the soil, and thus prolonging the time when the State should be under a high state of cultivation.

Perhaps I am more expectant than many others who have given much thought to the subject. I feel assured that most men in predicting the future progress in the development of the resources of the Pacific States, come far short of what will be seen by those who live twenty years from this date—that a general system, utilizing all the water flowing from the mountains to the great valleys, for irrigation, transportation, manufacturing and other purposes, is the most important feature in the future of our State. Being thus awakened to the importance of the subject, and the certainty that such a scheme would be accomplished, I saw there would be millions of cubic yards of earth to remove in digging the many miles of

I feel sure that my improvements in machinery have already been a benefit to the State by causing a great reduction in the price of dredging, and I hope they will soon prove to be of great importance to the commercial, farming, and many other interests of our country, especially on this coast. In such assurances, I am sustained by many who are well known to the public to possess a high degree of intelligence, and who occupy positions giving them that experience which best qualifies them to judge correctly with regard to the future progress of our State and country. I have not yet had a test to prove the value of my inventions adapted to land excavation, which I believe of more value than the same used for dredging. Nearly two years ago I succeeded in making a temporary experiment by attaching some of my improvements to an old dredge, which proved by its work done on the Oakland bar that there was value in my improvement; but those proofs did not materially strengthen me to raise means to carry forth the enterprise.

This was because of an unreasonable opposition by parties who would have done much better for their own interest and mine, also, had they been willing to deal with me honorably. After being for a time handicapped, I at last succeeded in finding a man able and willing to enter into a fair bargain to share with me to build a complete dredging machine. This machine is not yet as perfect as I am sure I can make it; but I earnestly invite all who feel an interest in the progress of the invention, and

in the construction of the canals of which I have spoken.

I am thankful to a kind Providence that I have been able to advance my enterprise to the extent I have, and with so great success. I am encouraged to persevere regardless of the opposition or hindrances that I may yet have to encounter. I am gratified to see the growing sentiment in favor of a general system of irrigation, and that there is a probability of some definite action in its favor at the present session of our State Legislature.

JOHN A. BALL.

Oakland, Dec. 30th, 1875.

American Progress.

The beautiful typical picture which we present this week is appropriate to the beginning of the Centennial year. It will lead our readers to step for a moment and look back upon the way along which our nation has advanced within their own memories, and will suggest also a thought forward to the lights which lie before us. It will bring vividly to mind the lines of our advancement and the obstacles we have overcome. The leading figure has in her right hand the secret of our advancement; the book being a fitting symbol of intelligence, civilization and education. From her left hand fall the wires over which thought flashes from ocean to ocean. Beneath her is spread the

of the individual companies' operations would require a long article to do any justice to their importance or magnitude. Every time one visits a mining camp there are some improvements to note in machinery or methods of manipulating—multiplying under-currents, changing their styles of rifles, etc., and when you converse with the inventors of these new methods, you find they know why the one arrangement is preferable to the other, both theoretically and practically.

At the North Bloomfield gravel mining company can be seen a very interesting invention of the superintendent, H. C. Perkins, for turning or changing the direction of the water discharge pipe. By the old appliances it sometimes required two or three men to change the direction of the pipe, but now a child four years old can easily change the direction of the discharge pipe of the largest chief or monitor. To effect this the device is simple and philosophical. An independent and outside nozzle of about ten inches in length is secured to the discharge end of the pipe, by a universal joint, in such a manner that the false nozzle may, by means of a small rod, be tipped slightly across the current of the escaping stream, and thereby cause the pipe to move in the direction or side where the obstruction is. When the direction is changed as far as desired, the false nozzle is adjusted in the line of the true nozzle, and being larger, the stream is not affected by it. This invention will probably be secured at an early day by letters patent.

Another Bonanza Suit.

Solomon Weill has brought suit in the Third district court against the Consolidated Virginia mining company. The complaint alleges that in 1861 the White & Murphy company was organized to work the White & Murphy claim on the Comstock lode, bounded on the north by the Kinney claim and on the south by the Dick Sides claim. The capital stock was \$126,000, divided into 849 shares. The Consolidated Virginia mining company was organized in June, 1867, with \$2,320,000 capital stock, in 1,160 shares, to work to the north of the Dick Sides claim, embracing 500 feet on the lode—the White & Murphy claim; the Kinney claim, embracing 50 feet; the Central Number Two, embracing 100 feet, and lying north of and adjacent to the Kinney claim; the California claim, embracing 300 feet, lying immediately north of and adjoining the Central Number Two. The capital stock of the Consolidated Virginia company has been increased to \$5,400,000, divided into 540,000 shares. The White & Murphy company duly conveyed its title in the White & Murphy ground to the Consolidated Virginia company at the time of the organization of the latter company. The plaintiff at the time of the transfer owned 38½ shares of the stock of the White & Murphy company, being one-half of 77½ shares, which stood on the books in the name of one Harris Jacobs. The complaint avers that the Consolidated Virginia company agreed with the White & Murphy company that the stockholders thereof should be entitled to own and hold of the capital stock of the Consolidated Virginia one share for each four shares of the White & Murphy company. Weill, therefore, claims that he is the owner of 7,365 shares of the stock of the Consolidated Virginia, and demands judgment that the company be required to issue a certificate for the same.

A similar complaint to the foregoing was filed in the same court against the company by Harris Jacobs, to establish his claim to a corresponding number of shares acquired in the same manner.

Chinese Miners—How They Work.

The Oroville (Butte county) *Mercury* says: On the bluff, just outside the town limits, and on the lot formerly occupied by Henry White, the buildings have been taken down, the vines and fruit trees pulled up, and in their stead is a steam pump, owned and worked by a lot of Chinamen. Numerous shafts, thirty, forty and fifty feet deep, are sunk into the earth, and the engine is kept at work all day pumping out the water, while gangs of men are at work in the ground, digging up the earth. A windlass is over each shaft, which is provided with a long rope and two tubs, with which to draw up the rich dirt. This is emptied into wheelbarrows and taken to a sort of reservoir, where the water is four or five inches in depth, and emptied in. In this water stand a number of Chinamen, with shovels, putting the wet dirt into the old-fashioned rocker. At the side of the rocker stands a patriarchal fellow, rocking away as carefully as does the mother her child. At night each rocker is cleaned up and the head man takes charge of the gold. For they would much sooner trust an American with their gold than one of their own number. Thus, day after day they work on, with less rest and comfort than the Southern slaves ever had. During all this cold weather not one of them ever wore anything upon his feet, except the "head men." Near each crew of men one can see a tea-urn, filled with cold tea, of which each workman takes a swallow now and then. Some of them, however, have a stronger decoction, called China gin, made at F. A. Mathews' ranch, one drink of which would cause a white man to hunt a blacksmith to screw down the top of his head. Altogether they seem quite happy and contented.

EDUCATION OF THE FLEA.—Mr. Bertolotto, the well known educator of the flea, is now in New York exhibiting his curious success in this line. The insects he employs appear to be the species of flea common to dogs. The first lesson, he says, is to put the insects in a small circular glass box, where, by jumping and knocking their heads against the glass for a day or two, the idea is finally beaten into them that it is useless to jump; and during the remainder of their natural lives, to wit, about eight months, they are content to crawl. Having corrected their intellects in regard to jumping, the instructor now fastens a delicate pair of wire nippers to the middle part of the flea's body; to the nippers any desired form of miniature vehicle, such as a wheelbarrow, a car, a wagon, etc., is attached, and the flea thus harnessed trots away with the load, to the great amusement of the lookers-on. The professor harnesses his insect pupils into a great variety of other positions, and makes them perform many curious duties, such as the operation of a fortune telling wheel, orchestra playing, racing, etc. They are allowed to feed twice daily upon the instructor's arm. It remains for Mr. Darwin and his co-seekers to determine what effect this system of insect education is likely to have upon the habits and development of future broods.

ALASKA, with its area of 570,000 square miles, will, if annexed to Washington Territory, make a very respectable sized county—about as large as Oregon, California, Arizona and New Mexico combined. With this addition, the Territory of Washington will have an area of 640,000 square miles.

At a Stated Term of the Circuit Court of the United States of America of the Ninth Judicial Circuit in and for the District of California, held at the court room in the city and county of San Francisco, on Thursday, the 30th day of September, in the year of our Lord one thousand eight hundred and seventy-five. Present—The Honorable Lorenzo Sawyer, Judge.

Nicholas Seibert, complainant, vs. Wm. T. Garratt, defendant.—In equity.

DECREED.

This cause came in to be heard at the February Term, A. D. 1875, of this Court and was argued by counsel and thereupon upon consideration thereof, it was ordered, adjudged and decreed, as follows, viz: That defendant, William T. Garratt, was not the first or original inventor, or discoverer of the improvement or discovery claimed by him, in and by those certain reissued letters patent of the United States, number five thousand three hundred and twenty-eight (No. 5328), for an alleged new and useful improvement in lubricators, issued to said defendant, William T. Garratt, on the 18th day of March, A. D. 1873, and is not entitled to a patent therefor, and that said reissued letters patent, number five thousand three hundred and twenty-eight (No. 5328) are declared void and the same are hereby vacated and set aside by reason of their interference with those certain letters patent of the United States, number one hundred and eleven thousand eight hundred and eighty-one (No. 111,881) for a new and useful improvement in lubricators, issued to complainant, Nicholas Seibert, on the fourteenth (14th) day of February, A. D. 1871.

It was also further ordered, adjudged and decreed that complainant do have and recover of and from defendant his costs and expenses to be taxed herein.

(Signed) LORENZO SAWYER, Circuit Judge.

The above decree has reference to "Seibert's Eureka Lubricator" for oiling the valves and cylinders of steam engines. It has a glass gauge and condensing pipe, or reservoir, with a regulating feed valve, and works as follows: As the water of condensation is admitted, under the oil, just so fast the oil passes out at the top through a pipe into the steam pipe to oil the valves and cylinder.

Parties who infringe or purchase the infringed lubricators, will be held strictly responsible.

N. SEIBERT, Patentee, 125 First Street, S. F.

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PASO ROBLES, CAL., October 18th, 1875.

DEWEY & Co.—Gents: The letters patent for the Tire Upsetter have come to hand. For the prompt manner with which you have brought the matter to a successful issue, please accept my thanks.

Yours Respectfully, JOHN H. MEYER.

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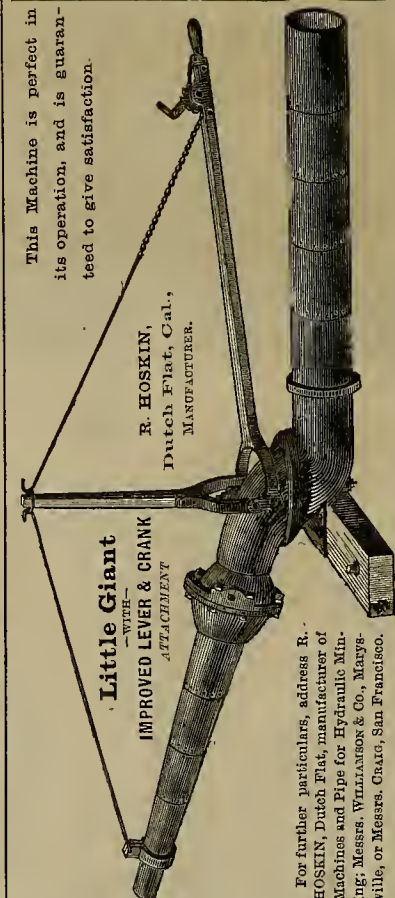
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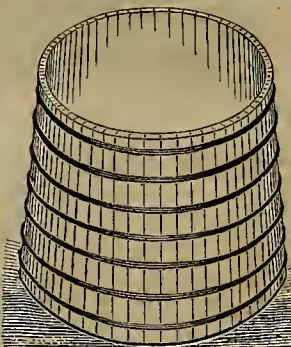
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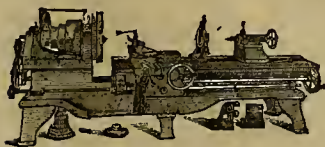
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And Takes the Place of All Others

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AUTOMATIC FEED,

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LIGHT VERTICAL BURR MILLS

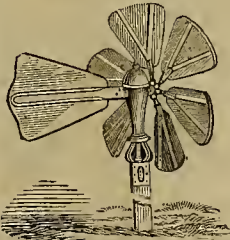
BARBER & BACON, MILLERS AND LUMBER DEALERS, SOUTH VERNON, Vt., write July 15th: "We have been running two of your Light Vertical Corn Mills for the past 6 months with remarkable results, and have ground over 5,000 bushels of corn into No. 1 meal in that time, running the mill night and day, as we run our saw-mill in the day time. We have often ground in the 20-inch mill (which weighs about 600 lbs.), 1,000 lbs. of corn in twenty minutes, or 54 bushels in one hour. Our usual night's work is about 34,300 lbs., or 434 bushels. To do this we have to run at a speed of 1,300 turns per minute, and use about a 20-horse power. You may refer parties to us for further information, and when we have tested your HEAVY VERTICAL MILLS, we shall take great pleasure in giving the results."

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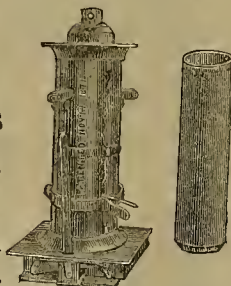
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In any part of the State, and

Work Warranted

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VIRGINIA CITY SUFFERERS' RELIEF FUND.

NOTICE.—All persons who wish to contribute money to the assistance of the sufferers by the late fire in Virginia City, will please make out their checks in the name of GEO. S. DODGE, Treasurer, and leave the same at Rooms 12 or 17, Hayward's Building, California street. Those sending cash will please forward to the same name and destination.

Several solicitors have been appointed, who are provided with pass-books signed by the President, Treasurer and Secretary. The Secretary will be daily in attendance from 9 A. M. to 3 P. M.

HON. J. P. JONES, President.

GEO. S. DODGE, Treasurer.

RICHARD WHEELER, Secretary.

New Books.

THE PACIFIC COAST DIRECTORY, FOR 1876, has just appeared, this being the third year of its publication. It contains the name and post-office address of each merchant, manufacturer, and professional, residing in California, Oregon, Nevada, Washington, Idaho, Montana, Utah, Arizona, Alaska and British Columbia; also, a gazetteer of the counties, cities and towns, with the Federal, State and municipal offices attached thereto, and an exhibit of the resources of the Pacific coast. The work was compiled by Henry G. Langley, with his usual accuracy. It shows that a great deal of labor and expense has been incurred in collecting the material, since a large amount of information, from different sources, has been collected. The general description of California is very full and well compiled, giving a great deal of useful information. A list of railroads of the Pacific coast is given, with the routes and details of operation; a list of the quartz mills in California is given, with the name, cost, date of erection, number of stamps, etc. There is also a table of the quicksilver furnaces, with similar details; also, a table of the grist mills, with location, name, run of stone, power and cost, owner, etc. The same details are given of the saw mills. There are tables giving the number of libraries, with the volumes; list of newspapers and periodicals, populations of towns and counties; meteorological tables, and these for the different States and Territories. The book is really a valuable one for reference, and should be in everybody's hand. We shall make some interesting extracts from it at a future time.

MARK TWAIN'S humor is so generally appreciated and well known that any criticisms on "MARK TWAIN'S SKETCHES," (Roman & Co.) now published in complete form, would be superfluous. The book is well printed and bound, and is profusely illustrated with appropriate engravings. In addition to the old there are several new sketches, all brimful of Mark's peculiar humor. The book is handsomely bound, and would make a good holiday gift. The "Jumping Frog restored to the English tongue after martyrdom in the French," is as funny as the original story; and the "Memorandum Croup" sketch will be read by the married men with great interest, as it is treated of something in their remembrance. The "Sketches" can be taken up with pleasure during idle hours, and will bear repeated reading.

VICK'S FLORAL GUIDE.—We have received a copy of Vick's Floral Guide for 1876. It is an excellent publication, and is praiseworthy in many ways. It is replete with new facts concerning flowers and vegetables, and with instructions concerning their culture. Among the most interesting topics we notice an illustrated essay on mushroom growing, and another concerning berry-bearing plants which are used for decorations. Mr. Vick also gives an entertaining account of his recent visit to the Yosemite valley. The Floral Guide is published at twenty-five cents a year, and may be obtained by addressing James Vick, Rochester, New York.

CROFT'S GUIDE.—The typical illustration, "Westward Ho," which we print elsewhere this week, was designed for Croft's Guide for the Overland Trip. Mr. Croft's publication has met a large sale, and is the standard work in its class. It is purchasable from the train boys on the overland trains.

The Ophir Mine.

The annual report of the Ophir silver mining company is quite interesting and exhaustive, being accompanied with elaborate and well arranged tables and statements, showing details of all operations. During a part of this year, while opening new parts of the mine for future operations, new bodies of ore were found, paying well for reducing, and indications of other bodies have been disclosed. It is a matter of remark and interest that the Ophir is the only one of so many mines on the Comstock that had rich ore when first opened, and also found it with depth. This fact is of great importance, and offers hopes for many other mines.

The Ophir has been in operation for fifteen years, and now stands more prominently out, perhaps, than ever before. The production of bullion last year exceeds any previous one by over \$300,000, and but for the very serious interruption by fire, would have been increased to more than half a million dollars. The greatest previous production was in 1863—\$1,514,222.21—while this year it was \$1,817,187.19. From the table of bullion production which we append, it will be seen that for the past five months the ore has steadily increased in richness, running up from \$26.94 per ton to \$58.54 per ton, giving a fair basis for reasonable anticipations when the ore body shall again be reached.

When the Ophir was first opened, we recollect that some four tons of ore were taken from the croppings and sent to this city, which worked about \$5,000 per ton. The mine yielded and paid well for some time, but for several years past has paid no dividends. The

past year it has been self-sustaining, and would probably have paid dividends had it not been for the fire. As before remarked, it is important to note that the Ophir is the only one of the Comstock mines which has struck rich ore in any quantity both on the surface and at a great depth.

With this encouraging outlook, and in the midst of the company's greatest prosperity, upon the eve of resuming dividends, the dire disaster of fire overwhelmed it, laying its valuable and costly works in ruins, and stopping all operations for a month or more. Works as fine as had ever been erected on any mine, had recently been completed at a cost of over \$300,000, and the mine was in fine working condition in all its parts when the fire of October 26th occurred, sweeping off everything consumable, and irreparably damaging a great portion of the machinery. In just one month's time, however, by the untiring zeal and superior management of Superintendent Curtis, the buildings and works were replaced and again ready for hoisting. But after overcoming these serious difficulties they had yet to meet another disaster in finding the mine flooded up to the 1500-foot station, with more or less slight caves from drift facings, by which there will probably be lost much good ore by being mixed with worthless debris and rendering it unfit for milling. Before the fire it was expected that dividends would be paid by the beginning of the new year, but the great damage both by fire and water defers that to the indefinite future.

During the fiscal year, up to October 26th, the date of destruction of the works, 51,322 tons of ore were extracted, which, with 105 tons on hand at mills, at the commencement of year, yielded bullion amounting to \$1,817,187.19. The superintendent, Mr. Samuel T. Curtis, reports that during the year a large amount of prospecting has been done on the different levels, several air channels and winzes constructed, making the mine very cool and producing beneficial results in the increased facilities afforded the miners to work. The main vertical shaft has been sunk 125 feet, and the upper 400 feet retimbered, before and after the fire. A large station has been cut out on the 1600 level, preparatory to sinking incline shaft.

"The prospecting on the lowest level (1700 feet) discloses in the west cross-cuts a great disturbance of the west wall of the lode, and the eastern cross-cuts as far as they have penetrated, have passed through 'horses' or masses of west country, and entered more favorable formation with stratum of low grade ore following out east, which evinces a 'heave' or pushing of the ore vein, and gives hopes of discovery of ore deposits on this level further east."

"The ore bodies on the 1300 level show strength in raising, and the angle of raise proves that the long abandoned 1100 and 700-foot stations were not prospected far enough east, by from three to five hundred feet, if the ore bodies discovered on the 1300 level raise that high. Two months ago, I started a drift southeast from the 1100 station to test this theory, the last work done in which showed signs of a favorable formation."

Very large and substantial buildings were erected, and powerful and first class pumping engine and gears, incline engines and gear and tapered reel; to the shaft of the latter were connected two hydraulic engines worked by the water of the mine, under a pressure of 400 feet head. Those hydraulic engines give an auxiliary power of 268-horse while hoisting, and in lowering form a water balance counteracting weight of giraffe and steel cable, and are calculated to save considerable fuel.

A large ore house was constructed alongside of railroad, to which the ore is to be raised by water elevator, using the same power as the hydraulic engines. This system of elevating the ore forty-seven feet to railroad was adopted after careful consideration and perfect surveys for line of switch from railroad, which it was found would cost \$45,000 for the only practicable route, whereas the hydraulic machinery cost but about \$6,000. Two air compressors were also put up, and compressed air introduced into the mine, which has proved serviceable and economical, running Burleigh drills, air fans and hoisting ore from winzes. All this powerful machinery and first-class buildings covering an area of 39,522 square feet, and forming one of the most thorough works on the lead were just completed when the terrible Virginia fire swept the works away, and with the one thousand cords of wood and nearly 400,000 feet of running timber. The heat was so intense that railroad car wheels were melted in the open air alongside the works. When the fire abated it was found that the heavy timbers of the galleys frame, partially burned, had fallen down the shaft, breaking a portion of the platform that had been put in to protect the shaft and mine, and the fire was working its way down the shaft. For thirty-six hours a stream of water was played down the shaft until the safety of the shaft and mine was assured.

On the day after the fire competent men were dispatched to the lumber yards of Carson and Dutch Flat, Cal., to procure and ship timbers. Machinery was telegraphed for; the new double reel hoisting engine and cables just completed for the combination shaft of the Chollar Potosi, Hale & Norcross and Savage, secured, and through the heaviest storms Virginia has seen for years, the old engine foundations were torn out and new ones to suit combination engine constructed, work was prosecuted without cessation, supplies hauled a considerable distance

on account of destruction of railroad tunnel and bridges, the works rebuilt and work through shaft resumed November 25th, being inside of thirty days from time of destruction.

While the reconstruction of works was going on, a donkey engine, furnished through the kindness of the Phil. Sheridan mining company, was put in place, with which they were enabled to re timber the shaft where it had been burned to a depth of 400 feet from surface, besides hoisting considerable of the water making on the 700 feet level of mine.

The buildings rebuilt have been made much larger, and more complete and convenient than formerly. Most of the machinery which passed through the fire has been made available, especially the new incline and pumping engines, which suffered but little damage. From the two hoisting engines of vertical shaft, which received most damage, one good engine has been completed at little cost, and foundations are being laid to put in place for hoisting power for a new compartment of shaft, which, when completed, will give three hoisting compartments and one pumping compartment, and give hoisting capacity of fully 1,000 tons per day. A considerable amount has been expended for new machinery and buildings during the year, but the amount covers the first construction of the extensive buildings and heavy, first-class machinery, and very nearly the amount of whole cost of reconstruction.

The total receipts for the year have been, according to the secretary's report, \$2,096,310.24, of which \$1,817,187 was from bullion, and from an assessment, \$201,600. Cash on hand, Dec. 15th, 1875, \$211,254. In the expenditures are the following items: Engines and machinery for Buck's shaft, \$177,968; labor on Buck's shaft, \$329,136; wood and timbers on shaft, \$104,042; wire cables, \$21,916; labor on the machinery at shaft, \$54,408; foundry work, \$24,588.

The cost of extracting the ore from the mine was \$256,614; cost of prospecting (labor, material, constructing air channels, sinking main shaft and underground repairs), \$299,017.03; machinery and buildings prior to November 1st, \$302,105.25; since November 1st, \$108,344.97; general expenses, \$21,266.43; milling ore (including \$132,476.50 paid on account of ore worked prior to December 1st, 1874) \$773,798.50. Total cost at mine, \$1,761,146.18.

We append a table of ores worked, assay values, bullion returns, etc.

Months.	Ore Worked.	Assay Value.	Yield.	Assay Value of Bullion.	Total.	Value of Total Yield.
Tons.	Per Ton.	Per Ton.	Per Ton.			of Ore.
December 1875.....	4,747	\$87.77	\$28.27	\$7,413.37	\$6,168.89	\$13,582.26
January 1876.....	4,429	86.33	26.34	49,886.25	68,298.97	118,185.22
February.....	3,838	86.17	26.31	32,860.27	44,666.67	77,526.94
March.....	3,183	81.70	26.35	43,702.69	36,661.84	80,364.53
April.....	2,764	49.20	26.37	38,961.79	17,608.22	56,570.01
May.....	4,522	45.41	26.34	31,350.35	70,952.31	102,302.66
June.....	5,100	45.84	26.32	81,058.35	95,088.30	176,146.65
July.....	4,860	65.80	43.77	119,376.61	140,648.33	260,024.94
August.....	4,860	65.80	43.77	119,376.61	140,648.33	260,024.94
September.....	4,860	65.80	43.77	119,376.61	140,648.33	260,024.94
October.....	4,860	65.80	43.77	119,376.61	140,648.33	260,024.94
November.....	1,841	61.83	58.54	42,170.61	38,422.11	80,592.72
Averages and Totals.....	51,322	\$35.83	\$26.10	\$1,817,187.19	\$590,938.31	\$2,408,125.50

The above table is quite instructive, and may be considered a representative statement of work on the Comstock. The yield per cent. of assay value, it may be seen, varies greatly. The gradual increase of value of ore up to the time of the fire can be seen. Another feature worthy of notice is the large proportion of gold, which is nearly equal to the silver, in the ore. Many people suppose that a very large proportion of the yield is silver, and that very little gold comes from the Comstock, but reference to this table will show that the idea is a mistaken one.

DEADMAN'S canon, Los Angeles county, is being surveyed for the purpose of discovering a better pass than Soledad.

The greatest coal of Mendocino county is a railroad from Ukiah to Cloverdale.

The spring crop of coughs and colds is heavy, and will ripen into a terrible harvest of disease and death, unless rooted out with the standard antidote, HALE'S HONEY OF HOREHOUND AND TAR. Pike's Toothache Drops cure in one minute.

General News Items.

THE Supervisors have refused to cede Union square for a postoffice site.

UNITED STATES troops are en route for the Southern frontier.

MOONT AND SANKEY are to be invited to this coast by the Ministerial Union.

THE "Commercial Bank" of this city suspended on presentation of a check for \$800.

THE Board of Underwriters of this city have petitioned the Supervisors to extend the fire limits.

MOULTON has instituted another suit against Beecher for malicious prosecution, setting the damages at \$50,000.

CAPTAIN James Towle has been re-appointed by the State Prison Commissioners Captain of the Prison Guard.

THE annual election of officers of the California Academy of Sciences will take place on Monday, January 3d, 1876.

AN eighty-hour trip from New York to San Francisco is contemplated. Three days and a third will be pretty good time.

CAPT. W. F. Swasey, the first Marshal of California, has been appointed United States Marshal of Wyoming Territory.

A GREAT battle has been fought between the government troops and insurgents at the seat of war in Herzegovina.

PRESIDENT GRANT has signed the bill further extending the time of duration of the Court of Commissioners of Alabama Claims to the 22d of July next.

ONE of the keepers of Queen's menagerie at San Leandro, came nearly being annihilated, recently, by the infuriated mother of a lion.

THE Pacific mills, Lawrence, Mass., announce a reduction of from 10 to 15 per cent. in wages after January 1st, owing to the depression in the price of print cloths.

IN the Louisiana State lottery, No. 16,709 drew \$50,000, and No. 2,249 drew \$20,000.

HENRY C. BOWEN, who sued the Brooklyn Eagle for libel, \$100,000 damages, has been awarded \$1,000 damages.

THERE has been received a formal acceptance by the Pope of an invitation by the Centennial authorities requesting him to give his recognition to the enterprise by a contribution of art from the galleries of the Vatican.

THE Three Brothers sailed Friday for Liverpool, carrying a cargo of 8,960,000 pounds, or 4,480 tons, of which 4,410 tons were wheat. On her first trip, October 23d, 1873, she carried 4,369½ tons and on the second trip, December 28, 1874, she had on board 4,480 tons of wheat.

MRS. ALVINZA HAYWARD sues for a divorce from her husband, Alvinza Hayward, the capitalist, on the ground of desertion. The answer to the complaint makes no denials, and joins with the prayer of the plaintiff to divide the common property—estimated at \$10,000,000.

THREE miners were killed by a snow slide at Little Cottonwood, Utah, on Monday last. One of them was James O. Moore, superintendent of the Highland Chief mine.

PATENTS & INVENTIONS.

A Weekly List of U. S. Patents Issued to Pacific Coast Inventors.

FROM OFFICIAL REPORTS FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.]

By Special Dispatch, Dated Washington, D. C., Dec. 23th, 1875.

FOR WEEK ENDING DECEMBER 14th, 1875.*

SLEEPING CARS.—Joseph Bolt, Benicia, Cal.

GAS HOLDERS.—Louis Marks, S. F., Cal.

WATCH CLEANING FLUID.—August Monnier, Sacramento, Cal.

TILTING DRAWER.—William S. Moses, S. F., Cal.

REVERSIBLE CENTER PINIONS FOR WATCHES.—Frank E. Smith, San Jose, Cal.

PRINTING PHOTOGRAPHS.—Benjamin Swasey, S. F., Cal.

CLUTCH.—Alfred Swingle, S. F., Cal.

DOUBLE ACTING PUMP.—Louis Bourier, San Jose, Cal.

LIFTING JACK.—Alexander Duncan, Dancon Mills, Cal.

HARNESS FOR FIRE ENGINES, ETC.—Edward O. Sullivan, S. F., Cal.

*The patents are not ready for delivery by the Patent Office until some 14 days after the date of issue.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

JURGEN HORWEGE was killed last Monday by the premature explosion of a blast of fifty kegs of powder in a mine at Comptonville, Yuba county. Other miners were severely injured.

THE Washington & Creole mine at Pioche has been sold at sheriff's sale.

WOODWARD'S GARDENS embraces an Aquarium, Museum, Art Gallery, Conservatories, Tropical Houses, Menagerie, Seal Ponds and Skating Rink.

New Incorporations.

The following companies have filed certificates of incorporation in the County Clerk's Office at San Francisco.

KERN RIVER HYDRAULIC M. Co.—Dec. 19. Location: Kern county, Cal. Directors—H. S. Jacobs, Jas. A. Pritchard, D. F. Bradford, E. R. Burke and Daniel Beck. Capital stock, \$5,000,000.

DELAWARE S. M. Co.—Dec. 19. Location: Gold Hill, Nevada. Directors—A. J. Simmons, J. C. Corey, J. M. Quimble, Thos. Eager, C. S. Miller, C. B. Higgins and Jas. Wilson. Capital stock, \$10,000,000.

ALTON G. & S. M. Co.—Dec. 21. Location: Nevada. Directors—W. H. Iban, J. W. Winter, G. P. Hinkle, M. M. Wheeler and M. Redding. Capital stock, \$10,000,000.

BLOOMER DITCH & GRAVEL M. Co.—Dec. 22. Location: Butte county, Cal. Directors—A. J. Severance, A. L. Fish, Benjamin Peart, John B. Reynolds and S. W. Buzzo. Capital stock, \$1,000,000.

MONTICELLO M. Co.—Dec. 22. Location: Virginia City, Nevada. Directors—William T. Higgins, Thos. H. Reynolds, Thos. R. Hayes, Alex. Badlam and Chas. W. Lamar. Capital stock, \$10,000,000.

NEW ALBANY M. Co.—Dec. 22. Location: Tuolumne county, Cal. Directors—Michael Castle, P. A. Benjamin, Judah Baker, Jr., I. Steinhart and John Walker. Capital stock, \$3,000,000.

MR. DABLO M. & M. Co.—Dec. 21. Location: Calaveras district, Nev. Directors—P. W. Shaw, Henry Sweetapple, F. A. Hanks, Geo. H. Gammans and H. H. Allen. Capital stock, \$5,000,000.

MEKINOTH M. Co.—Dec. 24. Location: Storey county, Nev. Directors—W. S. O'Brien, Joseph Clark, A. E. Head, J. F. Miller and John Skae. Capital stock, \$5,000,000.

ERINGTON M. Co.—Dec. 24. Location: Storey county, Nev. Directors—W. S. O'Brien, Joseph Clark, A. E. Head, J. F. Miller and John Skae. Capital stock, \$5,000,000.

GOLD BAR GRAVEL M. Co.—Dec. 28. Location: Placer county, Cal. Directors—Geo. A. Treadwell, T. Rogers Johnson, H. N. Blake, E. L. Willard and Geo. H. Baker. Capital stock, \$10,000,000.

COSO M. Co.—Dec. 22. Location: Inyo county, Cal. Directors—M. J. McDonald, J. P. Colp, George Lewiston, Francis B. Elmer and P. O'Neil. Capital stock, \$10,000,000.

TAHOMA G. M. Co.—Dec. 28. Location: State of California. Directors—S. Haydenfeldt, B. F. Hastings, John V. Plunne, R. B. Sanchez and H. McPherson. Capital stock, \$10,000,000.

PONNAR G. & S. M. Co.—Dec. 28. Location: Sierra county, Cal. Directors—R. Hewson, Charles E. Webb, John Hensch, A. B. Maguire and J. G. Wood. Capital stock, \$10,000,000.

METALS.

(WHOLESALE.)

WEDNESDAY M., December 29, 1875.

American Pig Iron, #100	24 00	36 00
Scott's Pig Iron, #100	25 00	37 00
White Pig, #100	24 00	36 00
Oregon Pig, #100	24 00	36 00
Refined Bar, bad assortment, #100	24 00	36 00
Refined Bar, good assortment, #100	24 00	36 00
Sheet, No. 10 to 14	24 00	36 00
Sheet, No. 16 to 20	24 00	36 00
Sheet, No. 22 to 24	24 00	36 00
Sheet, No. 26 to 28	24 00	36 00
Horse Shoes, per doz.	6 00	8 00
Nail Rod, #100	24 00	36 00
Norway Iron, #100	24 00	36 00
Roller Iron, #100	24 00	36 00
Other Irons for Blacksmiths, Miners, etc.	24 00	36 00

Braziers	25 00	37 00
Copper Tins	25 00	37 00
O'Neil's Pat.	25 00	37 00
Sheathing, #100	24 00	36 00
Sheathing, Yellow	24 00	36 00
Sheathing, Old Yellow	24 00	36 00
Composition Nails	24 00	36 00
Composition Bolts	24 00	36 00
STEEL—Kriegel's Cast, #100	24 00	36 00
Anderson & Woods' American Cast	24 00	36 00
Drill	24 00	36 00
Flat Bar	24 00	36 00
Plow Steel	24 00	36 00

TIN PLATES—	10 00	11 00
14x14 Charcoal	12 00	13 00
14x14 Charcoal	12 00	13 00
Roofing Plate 10 Charcoal	10 00	11 00
Banca Tin	24 00	36 00
Australian	24 00	36 00
ZINC—	12 00	13 00
By the Case	12 00	13 00
Zinc Sheet 13 1/2 ft. No. 10 to 14	12 00	13 00
do do 13 1/2 ft. No. 16 to 20	12 00	13 00
do do 13 1/2 ft. No. 22 to 24	12 00	13 00
do do 13 1/2 ft. No. 26 to 28	12 00	13 00
NAILS Assorted sizes	3 00	4 00
QUICKSILVER, per lb.	72 00	75 00

LEATHER.

(WHOLESALE.)

WEDNESDAY M., December 29, 1875.

City Tanned Leather, #100	22 00	23 00
Santa Cruz Leather, #100	22 00	23 00
Country Leather, #100	22 00	23 00
Stockton Leather, #100	22 00	23 00
Joblot, 8 Kil., per doz.	68 00	70 00
Joblot, 11 to 15 Kil., per doz.	68 00	70 00
Joblot, 14 to 19 Kil., per doz.	68 00	70 00
Joblot, second choice, 11 to 15 Kil., per doz.	57 00	59 00
Cornellian, 12 to 15 Kil., per doz.	68 00	70 00
Cornellian Females, 12 to 15 Kil., per doz.	68 00	70 00
Cornellian Females, 14 to 18 Kil., per doz.	71 00	73 00
Simon Ulmo Females, 12 to 15 Kil., per doz.	68 00	70 00
Simon Ulmo Females, 14 to 15 Kil., per doz.	68 00	70 00
Simon Ulmo Females, 16 to 18 Kil., per doz.	72 00	74 00
Simon, 20 Kil., per doz.	61 00	63 00
Simon, 24 Kil., per doz.	72 00	74 00
Robert Calif, 7 and 9 Kil., per doz.	35 00	40 00
French Kips, #100	40 00	42 00
French Sheep, all colors, #100	8 00	10 00
Eastern Calif for Backs, #100	1 00	1 25
Sheep Roans for Topping, all colors, #100	9 00	10 00
Sheep Roans for Lining, #100	5 00	10 00
California Knassett Sheep Lining, #100	1 75	4 50
Best Joblot Calif Boot Legs, #100	5 00	5 25
French Calif Boot Legs, #100	4 00	4 25
French Calif Boot Legs, #100	4 00	4 25
Harnes Leather, #100	24 00	25 00
Pair Bridle Leather, #100	43 00	45 00
Stirring Leather, #100	33 00	35 00
Wall Leather, #100	30 00	32 00
Skin Leather, #100	17 00	18 00
Wax Side Leather, #100	17 00	18 00

VICK'S VEGETABLE FLOWERS

Are the best the world produces. They are planted by a million people in America, and the result is beautiful flowers and splendid Vegetables. A Priced Catalogue sent free to all who enclose the postage—a 2 cent stamp.

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Saw Smithing and Repairing

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Each Saw is Warranted in every respect.

Particular attention paid to construction of

Portable & Stationary Saw Mills.

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BUSH STREET, ABOVE KEARNY.

JOHN MCCULLOUGH, Proprietor and Manager.

BARTON HILL, Acting Manager.

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With the best Dramatic Company in the United States.

Box office open from 9 A. M. to 10 P. M. Seats may be secured six days in advance.

"FAUSTUS."

Prices of Admission.

Dress Circle and Orchestra	\$1 00
Dress Circle and Orchestra, Reserved	1 50
Balcony	50
Balcony, Reserved	25
Family Circle	75
Boxes, according to location	\$10 & 25

Doors open at half past seven; Commence at eight o'clock.

nov 1-11

Mining and Other Companies.

Cherokee Flat Blue Gravel Company—

Location of principal place of business, San Francisco, Cal.

Location of works, Cherokee Flat, Butte County, Cal.

Notice is hereby given, that at a meeting of the Board of Directors, held on the twenty-eighth day of December, 1875, an assessment, No. 25, of five cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the company, room 13, Safe Deposit Building, No. 323 Montgomery street, San Francisco, Cal.

Any stock upon which said assessment shall remain unpaid on the third day of January, 1876, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Saturday, the nineteenth day of February, 1876, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

O. H. BOGART, Secretary.

Office, room 13, No. 323 Montgomery street, San Francisco, Cal.

Owyhee Water and Gravel Mining Company.

Location of principal place of business, San Francisco, Cal.

Location of mines, Elko County, Nev.

NOTICE.—There are delinquent upon the following described stock, on account of assessment, (No. 1) levied on the first day of November, 1875, the several amounts set opposite the names of the respective shareholders, as follows:

Names. No. Certificate. No. Shares. Amt.

M A Baldwin	37	100	\$30 00
M A Baldwin	43	7400	2220 00
B Lando, trustee	64	10000	3000 00
B Lando, trustee	60	50	15 00
O H Lagrange, trustee	39	100	30 00
T H Mayne	21	1000	300 00
J W Penn, trustee	36	100	30 00
J W Penn, trustee	40	19000	570 00
J W Penn, trustee	42	2500	750 00
H E Pearson	44	100	30 00

And in accordance with law, and an order of the Board of Trustees made on the first day of November, 1875, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, on the fifteenth day of January, 1876, at the hour of 2 o'clock, p. m., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

JOHN E. McDONALD, Secretary.

Office, No. 405 California street, San Francisco, Cal.

Pauper Mining Company.—Location of

principal place of business, San Francisco, California.

Location of works, Owyhee county, Idaho Territory.

NOTICE.—There are delinquent upon the following described stock, on account of Assessment No. 6, levied on the 9th day of November, 1875, the several amounts set opposite the names of the respective shareholders as follows:

Names. No. Certificate. No. Shares. Amt.

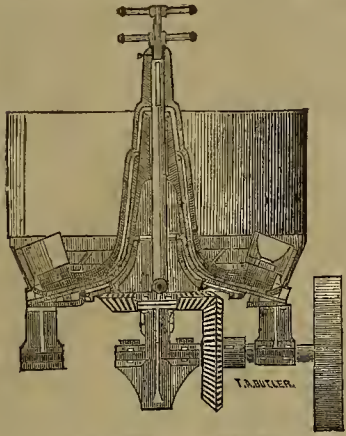
W F Bogart, Trustee	2	100	\$20 00
W F Bogart, Trustee	7	150	30 00
W F Bogart, Trustee	8	100	20 00
W F Bogart, Trustee	9	100	20 00
W F Bogart, Trustee	10	100	20 00
Crocker & Burnett, Trustees	11	25	5 00
Crocker & Burnett, Trustees	12	25	5 00
Crocker & Burnett, Trustees	13	25	5 00
G A Courson, Trustee	14	500	100 00
G A Courson, Trustee	15	500	100 00
G A Courson, Trustee	16	100	20 00
G A Courson, Trustee	17	100	20 00
G A Courson, Trustee	18	100	20 00
G A Courson, Trustee	19	100	20 00
G A Courson, Trustee	20	100	20 00
O P Gordon, Trustee	35	100	20 00

Names.	No. Certificate.	No. Shares.	Amt.
Jonas Lincoln, Trustee.....	55	50	10 00
W F Bogart, Trustee.....	62	100	20 00
W F B ogart, Trustee.....	63	100	20 00
W F B ogart, Trustee.....	64	100	20 00
W F B ogart, Trustee.....	65	300	60 00
W F B ogart, Trustee.....	66	750	150 00
W F B ogart, Trustee.....	67	150	30 00
W F B ogart, Trustee.....	68	150	30 00
W F B ogart, Trustee.....	69	150	30 00
W F B ogart, Trustee.....	70	225	45 00
W F B ogart, Trustee.....	71	75	15 00
W F B ogart, Trustee.....	80	25	5 00
W F B ogart, Trustee.....	81	25	5 00
W F B ogart, Trustee.....	82	25	5 00
W F B ogart, Trustee.....	85	50	10 00
W F B ogart, Trustee.....	88	50	10 00
W F B ogart, Trustee.....	89	50	10 00
O H B ogart, Trustee.....	90	300	60 00
O H B ogart, Trustee.....	91	1000	200 00
O H B ogart, Trustee.....	92	1000	200 00
O H B ogart, Trustee.....	93	1000	200 00
O H B ogart, Trustee.....	94	300	60 00
O H B ogart, Trustee.....	96	5	1 00
S E Holcombe.....	97	5	1 00
D L McDonald.....	98	5	1 00
A F Miner.....	99	5	1 00
Cope, Uhlir & Co, Trustees.....	101	25	5 00
Cope, Uhlir & Co, Trustees.....	102	500	100 00
Cope, Uhlir & Co, Trustees.....	103	500	100 00
Cope, Uhlir & Co, Trustees.....	104	500	100 00
Cope, Uhlir & Co, Trustees.....	105	100	20 00
Cope, Uhlir & Co, Trustees.....	106	100	20 00
Cope, Uhlir & Co, Trustees.....	108	100	20 00
J H H Williams.....	110	30	6 00
D Wilder.....	111	30	6 00
J N Hill, Trustee.....	119	100	20 00
Parker & Fry, Trustees.....	124	50	10 00
Parker & Fry, Trustees.....	125	50	10 00
Parker & Fry, Trustees.....	126	50	10 00
Parker & Fry, Trustees.....	127	50	10 00
G H Purdy, Trustee.....	135	100	20 00
G H Purdy, Trustee.....	137	50	10 00
H W Howell, Trustee.....	140	75	15 00
C E Eckerd, Trustee.....	141	150	30 00
N O Elford, Trustee.....	149	25	5 00
N O Elford, Trustee.....	150	25	5 00
W F Bogart, Trustee.....	156	100	20 00
W F Bogart, Trustee.....	156	50	10 00
W F Bogart, Trustee.....	159	100	20 00
W F Bogart, Trustee.....	160	50	10 00
Samuel Marks, Trustee.....	167	30	6 00
Samuel Marks, Trustee.....	168	30	6 00
W F Bogart, Trustee.....	172	50	10 00
W F Bogart, Trustee.....	173	50	10 00
W F Bogart, Trustee.....	174	50	10 00
W F Bogart, Trustee.....	177	100	20 00
H H Noble & Co, Trustees.....	180	50	10 00
H H Noble & Co, Trustees.....	181	50	10 00
H H Noble & Co, Trustees.....	182	50	10 00
H H Noble & Co, Trustees.....	183	50	10 00
H H Noble & Co, Trustees.....	184	50	10 00
H H Noble & Co, Trustees.....	185	50	10 00
H H Noble & Co, Trustees.....	186	100	20 00
H H Noble & Co, Trustees.....	187	100	20 00
H H Noble & Co, Trustees.....	188	100	20 00
H H Noble & Co, Trustees.....	189	100	20 00
H H Noble & Co, Trustees.....	190	100	20 00
C A Schmitt, Trustee.....	192	100	20 00
C A Schmitt, Trustee.....	193	100	20 00
C A Schmitt, Trustee.....	197	100	20 00
C A Schmitt, Trustee.....	198	100	20 00
C A Schmitt, Trustee.....	202	50	10 00
C A Schmitt, Trustee.....	203	50	10 00
H P Wood, Trustee.....	222	100	20 00
H P Wood, Trustee.....	223	100	20 00
H P Wood, Trustee.....	224	100	20 00
A Tence, Trustee.....	227	75	15 00
C H Bogart, Trustee.....	228	100	20 00
I Case, Trustee.....	229	5	1 00
W Turnbull & Co, Trustees.....	235	100	20 00
W Turnbull & Co, Trustees.....	236	100	20 00
W Turnbull & Co, Trustees.....	237	100	20 00
W Turnbull & Co, Trustees.....	244		

Iron and Machine Works.

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137 and 139 First Street, SAN FRANCISCO



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IRON CASTINGS of all descriptions at short notice. Sole manufacturers of the Hepburn Roller Pan and Callahan Grate Bars, suitable for Burning Screenings. NOTICE.—Particular attention paid to making Superior Shoes and Dies. 20v26.3m

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Iron and Locomotive Works,

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CAPITAL.....\$1,000,000.

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Manufacturers of Steam Engines, Quartz and Flour Mill Machinery, Steam Boilers (Marine, Locomotive and Stationary), Marine Engines (High and Low Pressure). All kinds of light and heavy Castings at lowest prices. Cams and Tappets, with chilled faces, guaranteed 40 per cent. more durable than ordinary iron.

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Wm. Norris, Wm. H. Taylor, J. B. Haggin,
James D. Walker.

WM. H. TAYLOR.....President
JOSEPH MOORE.....Vice-President and Superintendent
LEWIS R. MEAD.....Secretary
24v17-47

FULTON

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Quartz, Flour and Saw Mills,
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Sacramento.

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Dunbar's Patent Self-Adjusting Steam Piston PACKING, for new and old Cylinders.

And all kinds of Mining Machinery.
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Heavy and light Castings of every description. House Fronts, Mining and General Machinery estimated and constructed at shortest notice. On hand the celebrated Occident and French Ranges, Burial Caskets, Grates and Fenders, Road-Scrapers, Hydrants, Teyore Irons, Ploughwork, Sash Weights, Ventilators, Dumb Bells, Gipsies, Ship Castings, SOIL PIPE of all sizes, Fittings and Cauldron Kettles in stock at Eastern rates. SHOES and DIES a specialty. Ornamental Fences in large variety. 4v30-1yr.

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LIGHT AND HEAVY CASTINGS,
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IRON PIPE

FOR STEAM, GAS AND WATER.

Boiler Tubes

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LAP-WELDED PUMP COLUMN

FOR SALE BY

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Black Diamond Steel,

Etc., Etc.,

107, 109 and 111 FRONT STREET,

108, 110 and 112 PINE STREET, San Francisco.

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Patented May 26, 1868.

THE ONLY SAFE BLASTING POWDER IN USE.

GIANT POWDER, NO. 1,

For hard and wet Rock, Iron, Copper, etc., and Submarine Blasting.

GIANT POWDER, NO. 2,

For medium and seamy Rock, Lime, Marble, Sulphur, Coal, Pipe Clay and Gravel Bank Blasting, Wood, etc. Its EXCLUSIVE use saves from 30 to 60 per cent. in expenses, besides doing the work in half the time required for black powder.

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Established for the Manufacture of

RAILROAD AND OTHER IRON

Every Variety of Shafting.

Embracing ALL SIZES of
Steamboat Shafts, Cranks, Piston and Connecting Rods, Car and Locomotive Axles and Frames.

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Are prepared to make SHEET IRON AND ASPHALTUM PIPE, of any size and for any pressure, and contract to lay the same where wanted, guaranteeing a perfect working pipe with the least amount of material.

Standard size of railroad Car Wheels, with special patterns for Mining Cars. These small wheels are made of the best Car Wheel Iron, properly chilled, and can be fitted up with the improved axle and box—introduced by this company, and guaranteed to outlast any other wheels made in this State.

All kinds of Machinery made and repaired.
24v22-3m JOSEPH MOORE, Superintendent.

Brass Foundry & Pump Factory.

A. J. SMITH, Plumber,

Sole Proprietor and Manufacturer of the
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Smith's Copper-Lined Pumps,
Plumbers' Force Pumps.

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DIVERS' SUBMARINE PUMPS.

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HENRY S. SMITH.

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IRON CASTINGS

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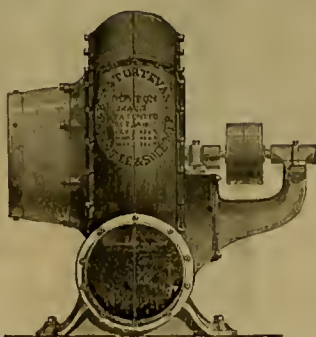
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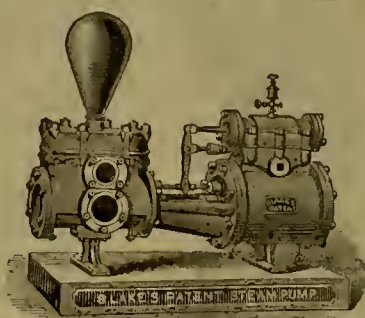
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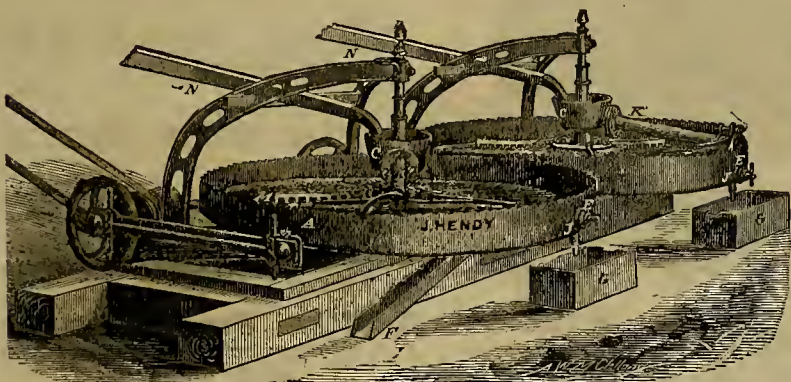


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I have been familiar with the workings of your Concentrators for four years past, have run them myself in the North Star Mine, Grass Valley; am familiar with their practical workings on the Empire Mine, Grass Valley; St. Patrick, Placer Co.; St. Lawrence, El Dorado Co.; Oaks and Reese, Mariposa Co., and most cheerfully give you this testimonial. For further information you are at liberty to refer to,

Yours respectfully,

JAS. H. CROSSMAN, M. E.

409 California street, or Cosmopolitan Hotel.

SAN FRANCISCO, April 27, 1872.

SAN FRANCISCO, February 10, 1874.

OFFICE SUPERINTENDENT OF KEYSTONE CON. M. CO., AMADOR, AMADOR COUNTY.

MR. J. HENDY—Dear Sir:—In answer to your inquiries as to your Concentrators furnished our company last July, I would say that I am more than pleased with them; and the saving to the company has been over \$3,500 per month more than with the blankets and buddles formerly in use.

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OFFICE SUMNER MINE, KERNVILLE, April 27, 1874.

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For description send for Circular.

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9v28-1m-ff

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WILL FEED WET OR DRY ORE.

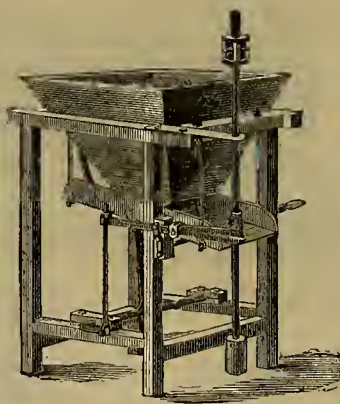
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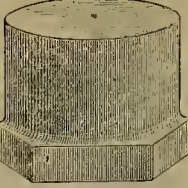
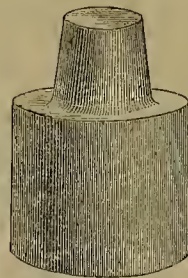
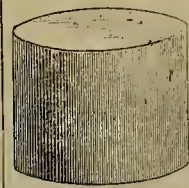
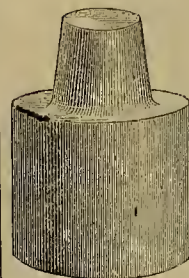
[PATENTED MAY 26TH, 1874.]

Price Reduced to 16 Cents Per Pound.

SAN FRANCISCO, November 10th, 1874.

To Supts. of Quartz Mills and Mining Men generally:

We take pleasure in stating that owing to the rapid increase in our orders, our Pittsburgh Manufacturers have been compelled to add largely to their works—a new gas furnace and heavier trip hammer—and are thus enabled to reduce the cost of steel and at the same time produce SHOES AND DIES superior to any yet manufactured. We have consequently reduced the price to 16 cents per pound and solicit a trial order, guaranteeing that you will find them at least 10 per cent. cheaper than the best iron. There are no STEEL SHOES AND DIES made excepting under our patent and sold at this office, or by our authorized agents, though certain Eastern manufacturers advertise STEEL SHOES AND DIES which are only cast iron hardened by the addition of a composition. They will not out-wear two sets of common iron, though called steel. They are very brittle and are not capable of being tempered, flying from under the hammer like cast iron. Our STEEL SHOES AND DIES are in use in many of the largest mills on the Pacific Coast, and all who have tried them pronounce them cheaper and far superior to iron in every respect, even at the old price of 20 cents per pound. Their advantages over iron are cheapness on first cost, increased crushing capacity, time saved in changing and in setting tappets, increased value of amalgam by absence of iron dust and chippings, and a saving of 75 per cent. in freight. It takes 60 days to fill orders from the manufactory East. Price 16 cents per pound shipped at San Francisco. Terms liberal.



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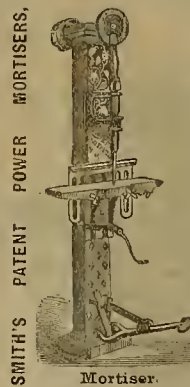
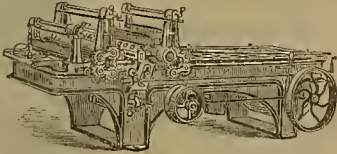
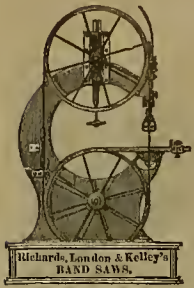
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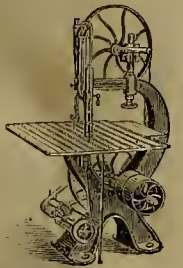
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Smith's Celebrated Molders.

We have four sizes of these Machines always on hand—"B," "C," "D" and "E,"—to work either three or four sides. Have slotted heads and all other improvements, and may be seen in any mill on the Coast. Prices reduced to 15 per cent. less than Eastern list. We have also, a large stock of all kinds of Planing Mill Machinery, such as Molders, Mortisers, Tenoners, Band and Jig Saws, etc. Send for our new illustrated Catalogue. TREADWELL & CO.



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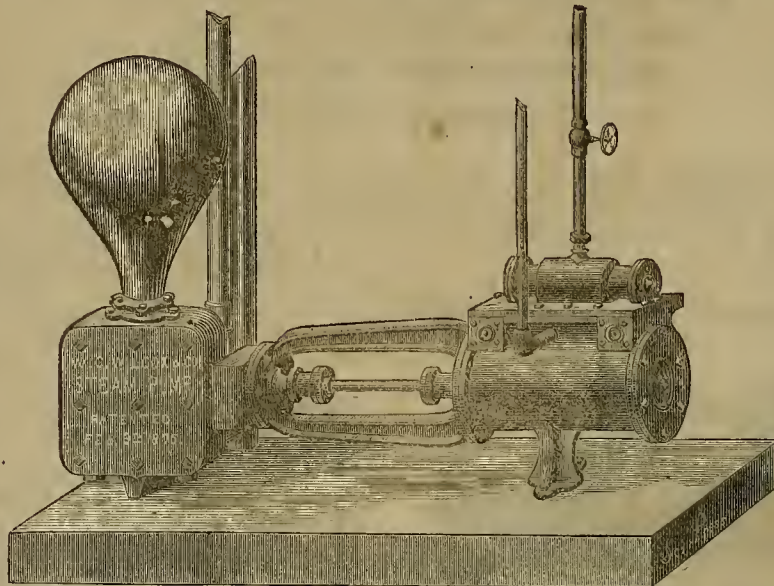
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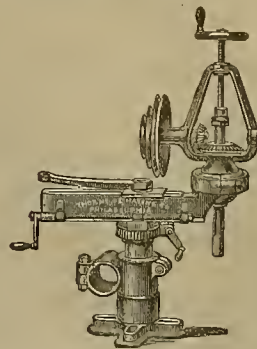
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For particulars and specialties of which see future announcements or "Bancroft's Illustrated Christmas List," which will be supplied free upon application.

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO.,
Patent Solicitors.

SAN FRANCISCO, SATURDAY, JANUARY 8, 1876.

VOLUME XXXII
Number 2.

The Kohler Reduction Works.

We paid a visit this week to the Kohler reduction works, which are situated about six miles from Oakland, and are connected on one side with the Central Pacific railroad, and on the other with the bay, so as to secure an easy transportation of ores and materials by land and water. The works are on a large scale, and when fully complete will involve the expenditure of a large amount of capital. When in complete working order they will be able to reduce fifty tons per day. Up to the present time over \$50,000 have been expended on the buildings, which, however, are by no means complete.

The buildings are substantially built and conveniently arranged. They comprise a frame building, 60x1,000 feet, well built, divided into business, assayer's office and laboratory, leaving ample room for the manufacture of concentrators. A one-story brick building, 26x60, with an artesian well in it capable of throwing forty-five gallons a minute, a 60-horse power engine and suitable boiler in place, with all necessary appurtenances. So far about 600,000 bricks have been laid on the works, including with the above-named brick buildings a chimney twenty-five feet square at the base, and roasting, smelting and refining furnaces.

The chimney of the works, now 75 feet high, will be 165 feet when completed. The smelting furnaces consist, at the lower part of their circumference, of a strong double wall of cast iron, and between these two walls a regulated stream of water is circulating, so as to prevent the iron walls from being destroyed by a too great heat; the upper part of the smelting furnaces are made of fire-bricks, and the escaping fumes of lead, antimony, arsenic and other volatile substances are forced to travel a long way before they reach the chimney, and to deposit in those underground chambers, and partly at the bottom of the high chimney, everything valuable that would otherwise be carried out in the open air and lost. They are constructed on plans by Mr. R. J. Kohler, the superintendent and inventor of the process. The furnace is arranged to put through 50 tons per day of 24 hours. It was started up for the first time this week on ore from the Reforma mine, Mexico. Mr. Kohler says he tapped it in one hour after firing up, which is pretty quick work. It works quickly and keeps from five to six men busy to keep it running. A four-foot blower furnishes the blast to the furnace and refining furnaces. The engine runs at 50 revolutions, and the blower at 2,500 revolutions per minute. The blast feed pipe is very large, fourteen inches in diameter, and the blower fills it to its utmost capacity.

The proprietors are unwilling to make the patents of the process public, but Mr. Kohler informs us that it is merely in the kind of flux he uses for various kinds of ores. He has had great experience in metallurgical operations of this character, and is firmly impressed that this process is the best that can be devised for rebellious ores. He proposes to save the sulphur, arsenic and antimony with fluxes. He charges the furnace every eight minutes with 500 pounds of ore, and keeps it running lively all the time. The ore at present being worked is very rebellious.

The refining works are not yet completed, so the bullion is base. The refinery furnaces are partially completed, and are the same as Mr. Kohler has used successfully in Mexico. He says he will be able to turn out his bullion 997 fine, and pass through five tons a day.

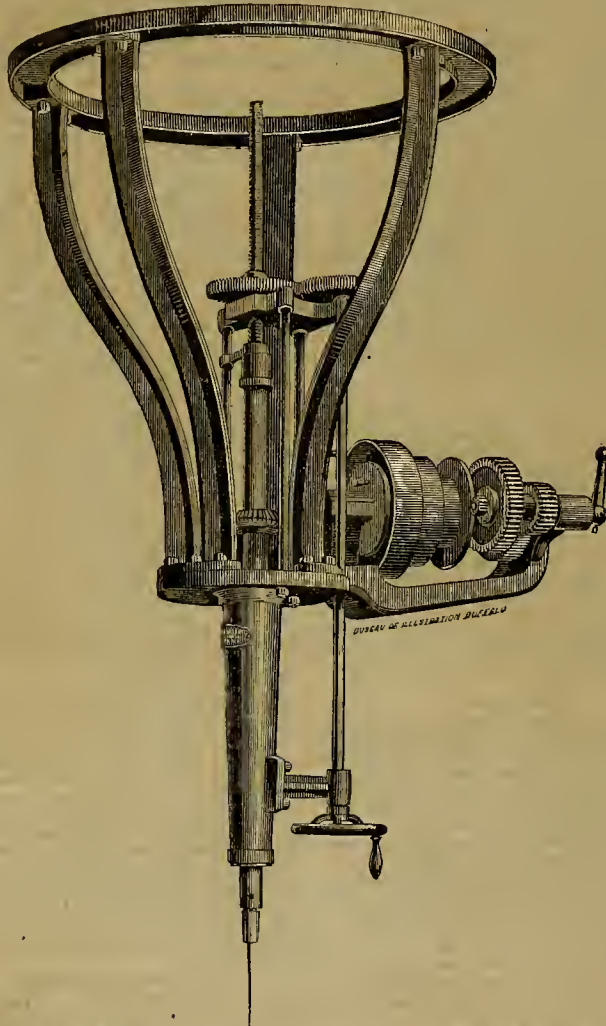
They have also partially completed a large roasting furnace to roast certain ores before smelting, and also to extract the antimony, arsenic and sulphur. Mr. Kohler says by this method he can work the ore to much better advantage, as it will save labor and cost in refining. The works are as yet by no means complete, as the company have had some financial embarrassments to contend with, which they hope soon to remedy. As soon as they are in complete working order we will have a more detailed description of the works.

TUCSON, Arizona, is building up rapidly. Among other structures recently erected is a school house, costing \$10,000.

Ventilating Pipes and Floodways in Warehouses and Buildings.

We learn from recent issues of the *Scientific American* that a Mr. John H. Morrell, an enterprising capitalist of New York city, who lately invested about a million dollars in the erection of a six-story warehouse with large safe deposit vaults attached, has recently invented a new system for ventilation and cleansing drain pipes in buildings; also an improved floodway for warehouses. The latter is intended to enply a quick discharge from the

ceptacles, the rain water which falls on the roof is collected and conducted to the various traps or closets, or water may be supplied to said reservoir by a pump or other convenient means. If the house is closed and empty, the system of pipes will serve as ventilators; and when a fall of rain occurs they will then serve to fill the traps, thus supplying the water evaporated from them, and, besides, washing them out, so that the frequent occurrence of an unoccupied house becoming filled with foul gases from its drains receiving no attention, is thus rendered practically impossible. This invention prevents all escape of noxious gases from drains or sinks, the danger of which is well known. Both of these inventions, though sim-



SUSPENSION DRILL MADE BY KIDD IRON WORKS.

sinks or reservoirs of a building to the drain pipe, and is so provided with valves that no foul air from the sewer can rise back into the house. In case of a fire breaking out in the lower stories, the smoke ascending the main sewer pipe will be prevented by the invention from escaping into the upper rooms through the reservoirs. A modification of the device is adapted for street sewers, to prevent the entrance of solid material to choke the drains, and the reflux of foul gases. The floodway is useful in cases of conflagrations, where water often does more damage to goods, etc., than the fire. Penetrating through flooring, it deluges everything below, ruining goods and furniture. The same occurs when water pipes burst. This floodway will rapidly draw off such water through a proper channel.

The device for ventilating and cleansing drain pipes by the same inventor involves arrangements for ventilating and for cleansing the sinks. By means of a reservoir from which distributing pipes lead to the various re-

ple, are ingenious and worth attention of insurance companies, fire departments, merchants, mechanics and property owners in general. Detailed descriptions of these patented inventions, with accompanying engravings, can be examined at 420 Montgomery street, in this city.

Suspension Drill.

The illustration on this page represents a suspension drill, of the pattern made by the Kidd iron works, Rochester, N. Y. The tool is invaluable in railroad and boiler shops. The frame is very strong and substantial. Back gears are furnished with it. The tools manufactured by these works are far the best patterns, and are very heavy. All workmanship is of the best quality and each tool is tested before leaving the works.

The rainfall for the year at Sacramento up to Wednesday, was 13.351 inches.

Salinas Mining District.

In conversation with Mr. Thomas Gilmore, superintendent of the Almaden Consolidated quicksilver mine, we recently learned some facts concerning the quicksilver mines in San Luis Obispo county. The Salinas mining district, as the district is called in which most of the mines are situated, is some fifty miles from the town of San Luis Obispo, to the northward, near the Paso Robles hot springs. The Almaden Consolidated mine has a twenty-ton furnace and some 2,000 tons of ore on the dumps. There are eight tunnels in the mine, one of which is 350 feet long. On the property is a hillock of clay which pays about one per cent. of quicksilver. The ore where they are now at work is three feet wide, but it is supposed to be only a feeder to the main body in the hill. They had up to the time the furnace was put up a one and one-half ton furnace or retort, and turned out from fifteen to twenty flasks of mercury per month. With the new furnace they have eight condensers and a chimney 400 feet up the side of the mountain to lead the fumes off. They have no true veins yet. All the feeders are rich and pitch into the mountain. The ore goes from three to four per cent., and about 500 tons of which are on the dump. The remainder will run from one to one and a half per cent. They do not do much sorting.

There are several other mines in the district. The Almaden Consolidated, San Jose, Oceanic, Santa Cruz, and the Gibson & Phillips being the chief ones in operation. The Gibson & Phillips company are putting up a furnace now, and the Oceanic has three. They are also striking ore in several different places in Monterey county. About five miles from San Luis they have recently discovered a deposit of chrome iron, and also some lead and antimony ore. They are now working a galena mine about thirty miles from the Almaden Consolidated, owned by a company in Cambria.

There are about 400 men at work on the various mines in the vicinity. Mahonysville, the central town, is becoming quite a place. There is plenty of wood and water thereabouts. The Almaden Consolidated mine is said to have a large body of ore. Some of it described as "chloride of mercury," of a peculiar white appearance, has been shown to us. This ore has heretofore been thrown away, but it has lately been found to contain about three per cent. of mercury, so it is now saved. It resembles the ore from the Reno mine, Nevada. We are doubtful, however, about its being chloride of mercury, as it would be considerably richer. Most of the stock in this company is owned by three men, and considerable money has been spent on the mine. The furnace, with engines and blowers has recently been put up, although they have been turning out quicksilver for the past year and a half with retorts.

DECEMBER WEATHER.—The Signal Service of the War Department furnishes the following report of the weather in this city in December: Highest bar., 30.353; lowest bar., 29.802; monthly range, .551; highest temperature, 65; lowest temperature, 39; monthly range, 26; prevailing direction of wind, north; greatest velocity of wind, 24 miles per hour; number of clear days, 13; number of cloudy days, 2; days on which rain fell, 10; fair days, 6; comparative temperatures—December, 1875, 51.5; December, 1873, 50.6; December, 1874, 47.8; comparative rainfall—December, 1875, 4.15 inches; December, 1872, 5.90; December, 1873, 9.72; December, 1874, .33; the daily mean barometer during the month was 30.149 inches; the daily mean thermometer, 51.5 deg., and the daily mean humidity, 81.4.

McAFFEE & SHEAR have recently furnished a large new boiler for the steamer *William Tubor*. It is 22 feet long, 15 feet in diameter and is 26 feet high over the top of the steam chambers. It has four furnaces 16 feet 6 inches wide, and weighs 50 tons. It was put in the vessel at a cost of \$18,500.

The Sinto tunnel is in 11,736 feet. The face is in good working ground, occasionally ontting stringers and feeders of quartz of an encouraging character.

CORRESPONDENCE.

The Alameda Avenue, Past and Present.

MESSENGERS, EDITORS:—Who has not seen or heard of the celebrated Alameda avenue, extending from San Jose to Santa Clara, a distance of three miles, built by the early Franciscan mission fathers about one hundred years ago? Perhaps some readers of the SCIENTIFIC PRESS, who may not have seen it, or enjoyed the pleasure of a drive under its grand old trees, would, nevertheless, like to learn something of its past history, as well as its present appearance and conditions—especially in these Centennial times, when everything that dates back for a hundred years seems to be regarded with special interest.

Alas! the old landmarks—these relics of past generations—are rapidly passing away before the march of our modern improvement. The old adobe tile-covered houses, with their venerable pear orchards and cactus plants, are passing away with the hands who built and planted them, and in a few more years they will all be numbered among the things of the past. An old Indian named Marcello died a few months ago near Alvieo, who, I am informed by the principal of the Santa Clara college, helped to plant the avenue trees in the year 1777. It is said he was a chief, the last one of his tribe. His age could not be ascertained, but it must have been several years over one hundred when he died.

These thoughts were suggested to my mind the other day, while driving along the avenue, by seeing a number of men engaged in trimming up the trees and cutting down those that had been condemned as decaying and dangerous.

Long years ago, when California gloried in her wide stock ranches, covered with wild oats and wild cattle, her low-topped spreading oaks scattered over her valleys, and everybody had leisure enough to enjoy their cooling shades, these old willow trees were permitted to grow free and easy just as they pleased, leaning and sprouting in every direction, as free and regardless of all rules of order and taste as the people who planted them were from the lumbering conventionalities of fashionable life. But these good old quiet, dreamy days are past and gone, and a great change has come. Where the patient mission fathers trudged quietly along the dusty trail from mission to mission under the shade of trees they had planted, the rumbling street cars now pass and re-pass every few minutes, and the numerous bus houses and grounds on every hand, the rattle of passing vehicles, and the hurry and stir of people in pursuit of business or pleasure, all proclaim beyond peradventure that the once lone avenue is fast becoming a busy street.

Now, of late years, a gang of men are employed every winter to go along the rows, trimming up the trees and cutting them back, trying to torture them into some kind of decent shape, as I suppose. And every year many of them are condemned to be cut for poor fire wood—"an axe is laid at the root of the tree." Thus they are rapidly passing away, giving place to others of varieties better suited to modern tastes.

As I drove along I had the curiosity to count all of the original avenue trees that remain standing. In the east-side row there are 271, and in the west-side row 330, making 601 trees—only about the one-seventh part of the original number. This calculation is based upon the way the trees stand, in the best preserved portion of the avenue. Most of the trees are the common black willow of the country, but there are a few eucalyptus and cottonwood. I had also the curiosity to measure one each of the three different kinds, selecting those of about the largest size. The willow measured ten feet in diameter, four feet from the ground, the eucalyptus eleven feet and the cottonwood twelve and a half feet; though perhaps not one half of the 601 trees would measure half as much. All of the willows are low topped, rough, bushy and crooked, and most of them look old and decaying; while the eucalyptus and cottonwood are upright and well shaped, and look healthy and vigorous. This may give an idea to what size trees of these kinds will grow in 100 years.

While in the tree measuring notion I drove over to Delmas avenue, San Jose, to interview a fine specimen of the Australian eucalyptus tree, planted only seventeen years ago. It measures six feet in circumference, four feet from the ground, and I estimated its height at 115 feet. It stands straight as an arrow—a perfect model of beauty, its dark green top towering up far above large Lombardy poplar and willow trees around it. There are thousands of these fine trees about San Jose, over-topping all trees and houses, and there may even be some larger than the one measured; but this will give your more distant readers an idea how rapidly these beautiful trees grow here. Suppose the Alameda avenue had been planted with eucalyptus trees, instead of the low-topped, short-lived willows, one hundred years ago; what kind of avenue tree would they have now made? They would rival the redwoods of the mountains in beauty and size. Or suppose some one had planted fifty acres of blue gum trees seventeen years ago on land as well adapted to their growth as that on Delmas avenue—and there is plenty just as good in the

valley—what kind of a fortune would he have to-day? Some one, perhaps, may imagine that this tree has been peculiarly favored by an isolated situation, separate from all other trees and shrubs, having a large expanse of ground to draw its nourishment from. But this is not the case. It has grown in the deep rich soil, near the Gualandoupe river, surrounded on all sides by large Lombardy poplars, willow and other trees.

G. W. M.

Santa Clara, Cal., Dec. 21st, 1875.

Nitro-glycerine and Its Product, Dynamite or Giant Powder.

[Written for the Press by E. G. GAERTNER.]

Nitro-glycerine and dynamite have, during the last five years, almost entirely taken the place of blasting powder, and formed one of the most important factors in the career of the recent vigorous prospecting of our mines, and the enormous railway and mining tunnels lately gotten under way or completed.

For not only are the articles in question possessed of an explosive power much superior to that of powder, gun cotton, etc., but, notwithstanding all assertions, beliefs or fears to the contrary, they are by far less dangerous to handle than any other known explosive.

Manufacture.

Nitro-glycerine is made of 16 parts sulphuric acid, eight parts of nitric acid and three parts of glycerine. The acids must be of the strongest kind, the sulphuric to be of 66° Beaumé, at 62° F.; the nitric of 48° at the same temperature. The first step taken is to mix the acids in the given proportion, the produced nitro-sulphuric acid to give 54° B. at 62° F. This is poured into a number of earthen vessels, placed in a trough, each having capacity for double the amount of liquids actually used in manufacturing. The mentioned trough is filled with ice water, and the vessels in it are supplied with stirrers, which may be moved by machinery or hand. After the acid has been brought down to a temperature of 50° to 55° F., glycerine, kept in its proper proportion at each pot, may be added by pouring it, small quantities at a time, in a fine stream into the acid, keeping the same well in motion and the thermometer constantly employed. Experience teaches, that the most nitro-glycerine is gained out of the same quantities of ingredients, if the temperature is always kept at 55° F. It may be well to mention here, for the benefit of any one who should desire to try the experiment, that a drop of water carelessly allowed to fall into the pot, will cause a sudden rise of temperature, and may be the cause of so-called burning, and under unfavorable circumstances, even an explosion of the whole batch. A pot commencing to burn, that is, to fume vigorously, the only salvation is in keeping up the stirring and adding ice to the water in the trough.

After the whole proportion of glycerine has been employed in the afore-described manner, the pot is taken out of the trough, and the contents of it dumped into a barrel of water. This barrel should hang in an axis fastened to it about midway, and previous to receiving the glycerine, the water in it should be given a circular motion by moving it with a piece of board. Now the water may be poured off, all globules of nitro-glycerine swimming in it gently held back and finally the residue transferred into a tub, where it should be treated with water, until all acid reaction (on litmus paper) has disappeared. The product is pure nitro-glycerine, and can either be used as such or manufactured into

Giant Powder.

The recipes for this are so manifold, and so many of them patented, all needed being an absorbent for the nitro-glycerine, that I shall only give here one which I have used for several years, producing a giant powder strong enough for hard slate cutting: Two parts nitrate of soda; one part rosin; one part sulphur (flour); one part sawdust, are well mixed, sifted, and nitro-glycerine enough added to moisten the mixture.

Nitro-glycerine, as well as giant powder is, previous to using, put into paper cartridges coated by a mixture of rosin and tallow, and exploded in the often described manner by caps and fuse.

Exploding quicksilver caps are employed, as they most readily fulfill two conditions necessary for the exploding of nitro-glycerine and its compounds.

Heat and Percussion.

Owing to the necessity of both of these actions, nitro-glycerine is comparatively safe to handle, if it is never confined in closed vessels. However well washed the preparation may be, and however free it may appear of all acid reaction before being packed, small quantities of acid (gaseous) will be separating themselves, causing latent heat to become free and a high degree of temperature to be produced. One of the conditions of explosion being thus complied with, it needs but an accidental percussion of the vessel or box containing either of the preparations to cause an instantaneous explosion. I am well aware of what I am saying, having been convinced by my own experiments, when I maintain the following: Nitro-glycerine should under no circumstances and giant powder only when quite fresh, be received for shipment; manufacture of the articles should be done where needed, and the daily supply made daily. If this is done the article is quite safe, even safer than gunpowder, as mentioned before, and disastrous explosions will become a thing of the past.

The San Juan Country.

A correspondent of the Denver Tribune gives the following general description of the districts in the San Juan country, Colorado:

To the people of Colorado little that is new can be told about the number and richness of the silver-bearing lodes of the San Juan country. In this article I will not attempt to make any statements about the "richest mining country in the world," where we have "mountains of silver, and valleys of gold," neither will I enter into predictions of its probable future, but I will confine myself to the simple narration of facts as they exist at the present time, thus showing in what condition the country is to-day.

There are six mining districts embraced in the country: The Summit district, situated twenty-five miles southwest of Del Norte, and on the Atlantic slope; the Animas, situated one hundred and ten miles west of Del Norte and on the Pacific slope; the Eureka, just north of the Animas, and embracing the headwaters of the river of that name; the Uncompahgre, just north of the Eureka, and embracing the headwaters of the Uncompahgre river; the Lake, east of the Uncompahgre, embracing the headwaters of the Lake fork of the Gunnison river; and the La Plata, situated about sixty miles southwest of the Animas district, and embracing the La Plata river and its tributaries.

The Summit District

Is essentially a gold bearing district. In it is situated the famous Little Annie that was reported sold a few years since to Denver parties, for \$410,000. From all reports the mine is not a vein or lode, but simply a claim, taken up on a mountain, which from appearances seems to be a solid mass of mineral. Numerous claims are taken up on the mountain and they are taken up without the least regard for direction. On this mountain are situated the Golden Star and Golden Queen. Ten stamp mills have been erected on these three lodes, capable of treating about ten tons of ore daily, and are now turning out each from \$700 to \$1,000 per week. The ore averages from \$20 to \$25 per ton in gold. There are other good mines in the district, but I do not know what improvements have been made on them, and therefore can say nothing definite about them.

The La Plata District

Is also a gold bearing district. The original excitement in that section was the reputed discovery of paying placer diggings. Until the last season, placer mining was about the only kind of mining that attracted any attention there. This season a large gold lode, called the Comstock, was found, which yielded some fine specimens of gold bearing quartz, of which large assays were made. Some mining experts from California and Nevada, among whom was Mr. Phillips, examined this district during the past summer, and expressed themselves highly pleased with it. It boasts of few improvements as yet, however. There is a large ditch for the working of the placer mines, and a few lodes, with quite an amount of work done on them. The Comstock is being worked this winter.

The Lake District

Is principally a silver bearing district. Some tellurium has also been found, yielding largely in gold. No district can show a more surprising growth than this. The principal town, Lake City, has within six months grown from nothing to a place of about 400 inhabitants, among whom are many men with wives and families. The houses are newly built and chiefly frame buildings.

The mines are of exceeding richness and some of them are well developed. The Hotchkiss has about a hundred and twenty-five feet of tunneling; the Little Chieftain has some seventy-five feet; the Big Cascade, some fifty feet. Other mines have also been considerably developed, and their showing is fine. Much pay ore has been shipped from this district, and has yielded well. Smelting works have been promised for next year, and before next August they will probably be in running operation. Barlow, Sanderson & Co. run a line of stages from Canon City to Lake City. This makes the Lake district the most accessible position of the San Juan country that lies on the Pacific slope.

The Uncompahgre District.

This is a very rich district. The veins are large, and the average of the ore greater than in any other section. It is a comparatively new district, and very little development has yet been done, but what has been done has produced wonderful results. It embraces a large area, and new discoveries, each being richer than the preceding, are continually being made. On the Burrows fork of the Uncompahgre are several lodes tolerably well developed. The Dewitt and Wickers lodes each have a twenty foot drift. The Red Cloud and Ben Butler have a thirty foot drift, the drift on the Red Cloud being twenty feet wide. Among the other lodes that have little more than assessment work on them, but which show very rich mineral for their development, are the Denver, Vermillion, Updee, Marion, Burrows Nos. 1 and 2, Yankton and Mastodon.

There are two mining companies working mines in and about Burrows fork—the Dakota and San Juan and the Buffalo and San Juan mining companies. Another company has been organized, which is putting up machinery and concentrating works of forty tons daily capacity, in their principal camp, Mineral City. This town consisted of one solitary cabin last

June. It now boasts of a population of 150 persons.

On the Poughkeepsie fork of the Uncompahgre are situated some fine mines. None of them are developed to any extent, but nearly all of any note have yielded considerable ore that has brought high prices. The Saxon lode has shipped ore to Black Hawk that has brought \$1,700 per ton for first-class, \$1,400 for second-class, and \$900 for third-class. They have also sold considerable to Green & Co., of Silverton, for high figure. Two tunnels will be driven on the lode this winter.

The Tyrol, on the same vein as the Saxon, has also sold considerable ore this summer. They have a tunnel of twenty-five feet on the mine, and it is being worked at present, and will be all winter. A shaft thirteen feet deep and, in size, four by six feet, on the Alaska lode, has furnished \$18,000 worth of ore. This mine is being worked this winter. The Poughkeepsie has furnished a large amount of ore the past summer, that has brought its owners handsome figures. On Red mountain are located some fine lodes, two of them having a fifty foot tunnel each. Near Mt. Sniffles are some fine lodes, one of them carrying ruby silver, being worked this winter. Near the mouth of the Uncompahgre canon, near the new town of Ouray, some rich discoveries have been made, and a large number of men are at work there now and will be during the winter. One assay made from ore from a mine in this section was \$36,000 to the ton, showing that the ore was nearly pure silver, pure silver furnishing an assay of a little over \$37,000.

Butte County Quartz Mines—The Paul Process.

During the past summer, we frequently referred to the quartz mining carried on at Forbestown, and spoke of the place as destined to be the most important in this particular of any in the State. After all the good things we had said, we were much surprised to learn that the new ten-stamp mill had shut down and was as silent as the grave. We knew that the rock contained gold in quantities that would gladden the heart of any quartz miner. What could be the matter? We went to headquarters for our information and got it. The gold could not be saved after the rock had been crushed. We believe the same cry has gone up from hundreds of ledges all over the State. Luckily, the owners had a small stake laid away. They had heard of the Paul process and were determined to try it. It was an experiment that would cost them only about \$5,000, and if it failed they would be out that much more; but if success attended their efforts, a golden harvest was sure to be theirs. The proper machinery was bought and soon placed in position. Does it save the gold? Look at the jolly countenance of any of the owners in the mine and the answer will be plainly seen. A couple of them visited us one day last week, and we took occasion to make all the inquiries that we dared make, lest they should think we were too much interested in their business. The rock they are now crushing pays from ten to forty dollars to the ton, and they save almost all of the gold. They run night and day, but with their small mill crush only ten tons during the twenty-four hours. They might crush more, but the Paul arrangement will not dispose of a greater amount. The grinding and setting process is only ten tons per day; but, though small, it is done in a most satisfactory manner. The mine that is worked during the winter season is only some 200 feet from the mill, and the rock is easily run into it upon a car. There is every prospect now of complete success, and failure can only result from a want of rock.—Oroville Mercury.

The Glencoe Consolidated Mine.

The Calaveras Chronicle says: We understand that the company lately incorporated, under the title of the Glencoe Consolidated, for the purpose of conducting mining operations in Glencoe district in this county, are preparing for the commencement of developments upon a very extensive scale. The company's location is one of the most promising mining properties to be found anywhere. The ledge is easily traceable, by surface croppings, for a distance of two miles, and evidences that the lode is a true and permanent one are found at every step. The formation is also of a character that almost invariably gives stability to the veins it carries, and the lode is accompanied, its entire length, by that soft blue gangue that practical miners accept as the most favorable indication possible. The ledge is a mammoth one, averaging six feet in thickness, carrying an extraordinary rich pay streak averaging fully three feet in width. But more tangible evidence of the richness of the ledge has been had than an accumulation of all the favorable indications in the world could give. A shaft has been sunk upon it to a depth of eighty feet, the ore extracted yielding an average of \$40 per ton by ordinary milling process. Everything considered, we do not believe a more promising location for successful mining operations than that chosen by the Glencoe Consolidated company can be found anywhere. The facilities for the erection and working of machinery are excellent, and in fact no opportunity for rapid development is lacking. As soon as the condition of the roads and estate of the weather will permit, operations will be vigorously pushed upon a much more extensive scale than has been customary in the upper country.

MECHANICAL PROGRESS

Stencil Plates by Electro-Magnetism.

One of the most ingenious and novel applications made of electro-magnetism, is that invented by Mr. Edison, and exhibited at the fair of the American Institute in New York to perforate stencil plates by means of an electro-magnetic writing pen, which has in its blunt end a sharp point which is continually projected and retracted with a velocity of more than 1,000 times a minute, so that in writing with this pen on paper the lines written consist of a series of holes very close together, and the words written or figures drawn may be seen when holding the paper to the light. The sheet thus written upon forms a kind of stencil plate, and being placed on paper, an impression may be taken from it by simply passing a proper ink over it by means of a printer's roller, when the ink will pass through the holes and make their marks on the paper under it. In this way 1,000 or more impressions may be made from a single stencil-plate thus written by the electro-magnetic pen.

The construction of this pen is the main feature of the invention. It carries in its top a small electro-magnet with a revolving bar, making some 1,000 or more revolutions per minute; the electro-magnet is connected by means of flexible copper wires to two small cups of a carbon chromic acid battery, while a current breaker on the axis of the revolving bar, interrupts the current twice at every revolution, in the same way as all such machines are constructed. This axis also carries an eccentric, which gives an upward and downward motion to a bar passing through the body of the pen and projecting below with the small point mentioned, while this point makes the perforations by the power of the electro-magnet in the top of the pen. We have no doubt but that this small machine will find many other applications besides that of writing circulars, for which at present it seems to be solely intended.

TWO NEW STREET ENGINES.—A new traction engine for street usage has recently been tested in Brussels, Belgium, with satisfactory results. Externally it resembles an ordinary street car, with the exception of the chimney which projects through the roof. The body is placed quite low, and the wheels, which run on rails, are concealed to within a short distance from the ground. The boiler is tubular and inextensible, and is heated by coke. The engine is one of the Brotherhood three-cylinder pattern. The exhaust is condensed in a tubular condenser, and the boiler is fed by a separate steam pump. The machine traveled without smoke or escape of steam, made no more noise than an ordinary horse omnibus, and turned sharp curves very easily. Another engine is introduced in Paris; but instead of running on a tramway like the above, it is a kind of omnibus or steam carriage. It accommodates twelve passengers and weighs about five tons. A vertical engine supplies the motive power and occupies a space in the rear of but thirty-nine inches high by thirty-one inches broad. A Giffard injector forces in the feed water, which is taken from the gutters or any other convenient source. The machine will travel at the rate of nine miles per hour. About thirteen-horse power is utilized, requiring 600 quarts of water, and 110 pounds of coal per hour.

COMPOUNDING STEAM ENGINES.—The controversy as to the possible economy of compound engines has been long ago settled, and the advantages of the additional cylinder and piston, to be operated by the steam exhausted from the first, have been proved beyond any doubt. But the economy is not derived, as some seem to think, from using steam twice, for whether the steam passes through one cylinder or forty, the difference between the pressure of the steam at its entrance to the first cylinder and its final exhaust into the atmosphere is the sole power which the engine can exert. The low pressure, larger cylinder added to an engine, while it discharges its steam at lower tension, creates a certain amount of back pressure in the first or smaller cylinder; and there is, therefore, no positive gain of power in a compound engine. But the larger cylinder enables that little understood and most important part of steam, its elasticity, to be much utilized; so that it may be said that the additional cylinder is equivalent in result to a very effective cut-off.

BREAKING WEIGHTS.—A correspondent of the *Scientific American* writes as follows: Some time since I ordered some short timber to be placed on some joists in my shop, and left. When I returned I found it all placed on two joists, and I took one-third off. Twenty-four hours afterward the joist broke. Why did it not break when all the timber was on? To this query that journal responds: Time is an element to be taken into consideration in overcoming the strength of the fibers of timber. Two-thirds of the load in this case was sufficient to break the joist in twenty-four hours after one-third had been removed; but a much shorter time would have sufficed to break it with the whole load upon it.

WHILE steel is made harder and stronger, in proportion to a certain amount of contained carbon, cast iron, when it is very rich in carbon, is soft like plumbago, will break by its own weight, and may be cut with a knife.

Novel Water Motors in Mines.

At the Sulzbach, Altenwald colliery, near Saarbrücken, Prussia, machinery has been established for the transmission of power from a steam engine at the surface, by a column of water circulating under pressure, the circumstances of the case not admitting of the establishment of a direct acting steam pump underground. The mine is sunk 306 yards below the surface. The piston rod of the high pressure engine above is connected with the pressure plungers, each of which plungers is connected with the underground engine by a tube filled with water. The last mentioned engine consists of four pressure pumps arranged in pairs, and between each pair is placed the working plunger of one of the mine pumps. When the engine on the surface acts, the power is transmitted by one pressure plunger through one water tube to a pair of pressure pumps underground, and thence to one working plunger, which either aspirates or forces air, according to its position. The opposite pair of pumps and connections work conversely. The water is forced into an air vessel, and thence through the rising main 803 yards in height, in one lift to the surface. On the change of stroke, the water in the cylinder of the pressure pump rises in the second water tube and follows the retiring pressure plunger at the surface, the power supplied by the descent of the water in one column being sufficient, with the exception of a slight allowance for friction, to effect its return in the other. If the catalyst pauses of the engine at the surface are not too long, the discharge is practically continuous. The *Engineering and Mining Journal*, from whose translation of the German description the above is condensed, adds that at the Pboeniz mine, in Cornwall, England, an arrangement of similar description, consisting of a plunger attached to the main pumping engine, connected by a length of tube with water pressure engine in another shaft, has been at work for the last ten years.

A Machine for Darning Stockings.

The *Scientific American* thus describes the latest Yankee notion: "Imagine, ye mothers of large families, who ruefully contemplate dilapidated socks by the dozen, after the week's washing, with visions of strained eyes and tired backs floating across your minds; imagine a little apparatus infinitely more simple than the sewing machine, which repairs the largest darn in much less time than we can describe the operation, and far more neatly than you can do it with all your years of practice. This is what it is. Two small plates, one stationary and the other movable, are placed one above the other. The faces are corrugated, and between them the 'holy' portion of the stocking is laid. Twelve long eye pointed needles are arranged side by side in a frame, which last is carried forward so that the needles penetrate opposite edges of the hole, passing in the corrugations between the plates. Hinged just in front of the plate is an upright bar, and on this is a crosspiece carrying twelve knobs. The yarn is secured to an end knob, and then, with a bit of flat wire, pushed through the needle eyes. Then the loop between each needle is caught by the hand and hooked over the opposite knob, so that each needle carries really two threads. Now the needles are carried back to their first position, and, in so doing, draw the threads, which slip off the knobs through the edges of the fabric. A little push forward again brings the sharp rear edges of the needle eye against the threads, cutting all at once. This is repeated until the darn is finished, and beautifully finished it is. The inventor is Mr. O. S. Hosmer of Boston, and we predict for him the blessings of the entire feminine community. The cost of the machine is but ten dollars."

AN IMPROVED BARREL.—Mr. L. E. Sunderland, of Williamsburg, Va., has devised a new style of barrel, the object of which is to provide a barrel for the shipment of produce, which shall be capable of transformation after the said produce is delivered, so as to occupy a comparatively small space, and be returned to the sender at the rates of solid freight and at a comparatively trifling cost. It consists in a series of staves, connected by hoops which have peculiar fastenings, which adapt the staves to be disposed flat for return transportation, or rolled up and fastened to form a barrel. The sides of the barrel are straight, and the heads are held in place by lugs alternating, when the barrel is set up upon opposite sides of the head. The heads are thus of less diameter than the inside of the barrel, so that the barrel, when returned, may be packed full of heads, and the rest of the barrel sides packed flatly together.

THE DUNDERBERG, or Stevens battery, which this government allowed to be sold to the French government, is now considered one of the most formidable war vessels in the French navy, where she is known as the *Rochambeau*. She is an immense iron-plated ram, displacing 7,000 tons of water, and has a larger deck surface than any war vessel ever constructed.

SOFTENING AND TIGHTENING WOOD.—If blocks of wood intended to be used for cutting veneers are first boiled or steamed in a solution of ammonia and borax, they will not only become soft and easy to cut, but the veneers formed from them will retain their flexibility for an indefinite length of time.

SCIENTIFIC PROGRESS

How Flames Become Luminous.

Professor W. Stein, in a recent number of the *English Mechanic*, thus intelligently discusses on the Luminosity of Flames.

The correctness of the old and well-founded conception that the light of flame is caused by incandescent carbon molecules, has been disputed by Dr. Frankland, who contends and tries to prove that it is derived from hydrocarbon vapors.

As proof of his ideas he mentions that the soot deposited on a cool surface, when introduced into a flame, does not consist of pure carbon, but that it contains also hydrogen; that, in fact, it seems nothing else than a collection of the densest light-giving hydrocarbons, whose vapors condense on the cold surface.

Against this we may mention they not only do the heavy hydrocarbons, but even marsh-gas, split up at high temperatures on exclusion of atmospheric air; and as the hydrocarbons, whose vapors are supposed to cause the luminosity of the flame, are precisely under such conditions before they come into contact with the air, it cannot be doubted that they suffer decomposition into carbon and hydrogen in the luminous portion of the flame. It is of little importance whether the eliminated carbon is chemically pure, or whether it contains still a hydrogen compound; the important question is this—Is the soot held by the flame in the shape of vapor or in the solid form? If the soot was nothing but a conglomeration of the densest light-giving hydrocarbons, whose vapors condense on a cool body, then, when sufficiently heated by exclusion of air, it ought to reassume vapor form. This is, however, not the case, as every one will find who tries the experiment.

Its chemical composition is just as little favorable to Frankland's view. It ought, presumably, to vary according to the lighting material from which it was derived—nay, even according to the place of the flame wherefrom it was deposited. It is well known that the temperature of the flame varies in various places, and Magnus experiments have proved that form heavy hydrocarbons at a less high temperature a hydrogenous tarry product besides hydrocarbon is also eliminated.

"How could the light of a flame be as transparent as in reality it is, if it was filled with solid carbon particles?" asks Dr. Frankland.

In reply to this, it must be admitted that one is able to read the writing held behind the flame of a bat's-wing burner. It is, however, easily observable that the flame is more transparent in the lower non-luminous portion. The reading also becomes more difficult through a flame of greater thickness, and impossible through the flame of a candle or petroleum burner. If, as is proved hereby, the transparency of a flame is only very limited, it may also be remembered that one can also read the same writing through media which are known to be filled with solid particles. The fact that solid bodies are by preference apt to become light-radiating is not at all changed by this, and thus far it is demonstrated only that there can be but one solid body to which the luminosity of light can be attributed. If we consider, therefore, all the facts, we can draw only one conclusion, namely, that the light of illuminating flame comes from incandescent carbon molecules, and that the old view is still to be retained.

NEW CLASSIFICATION OF BODIES.—Mr. Mendeleeff, a Russian chemist, classifies all known bodies, elementary and compound, by an arrangement of vertical and horizontal lines, according to the likeness or dissimilarity of these bodies and the numerical value of their characteristic elements. He thus makes a double table in which all known bodies are arranged, so that it is possible to pass from one to the other by the multiplication of one factor by another. Remarkable that a large number of gaps occur in this table, he thinks it probable that they correspond to bodies unknown at present, the existence of which will one day be discovered. According to the relative position of these gaps he is able to show beforehand their properties and characteristic numbers (equivalent weight, density, etc.) If, for example, this table had been made before the discovery of bromine, the place of the latter could have been anticipated between chlorine and iodine, and its properties pre-indicated. The newly discovered metal, gallium, occupies a place which was blank in Mendeleeff's table, corresponding to a body which its author would have named by hypothesis hexaluminum, with a density 0.9.

NEW MODE OF ILLUMINATION FOR LIGHT-HOUSES.—Prof. Batestrieri, of Naples, proposes for this purpose an apparatus composed of several disks of polished silver or copper, so arranged as to transmit successively the light received, so that all the rays falling upon the disks are concentrated into one powerful beam. The invention resembles the system of Fresnel, but the latter utilizes only about one-third the light received, while M. Batestrieri's device, it is said, utilizes the greater portion. With an oil lamp having a burner 2.7 inches in diameter, at a test of the above described apparatus, a beam of light was transmitted which enabled a newspaper printed in ordinary type to be read at the distance of 0.6 of a mile.

A New Method of Finishing Photographs.

In the first place enamel your print, as enameling, though not absolutely a *sine qua non*, is a decided advantage. We will suppose this has been effected, the subject having been printed in an oval. Now let a mask be constructed, of eight-sheet cardboard, of sufficient size to entirely cover the enameled and mounted picture, with margin to spare; glue a piece of sand-paper on one surface, rough side out, and when dry cut out an aperture of the exact dimensions of the picture to be finished, taking care the edge is accurate and smooth; adjust this paper die, so to speak, on the face of the enameled picture, and apply pressure. Passing them through an ordinary rolling press answers the purpose well. The result is that the parts in contact with the sand-paper surface are roughened or rendered matt, offering a pleasing contrast to the polished surface of the picture, and in this consists the novelty.

Paper lace and various textile and other fabrics can be substituted for sand-paper, or a metal plate could be engraved to produce any pattern. Many substances will suggest themselves to the experimentalist, and variety of ornamentation can be easily devised by altering the shape of the mask. For my own part I prefer sand-paper to most other substances. Any degree of fineness of surface may be got by this means, and by slightly shifting the position of the mask and putting through the press after each alteration.

I think that ornamentation, when produced by merely altering the texture of the surface, is of a much more refined character than when gold or color is applied for the same purpose. The plan here described has been found thoroughly workable with little trouble and less expense, as one sand-paper mask will impress a great number of surfaces, and its renewal is most easily managed. All I can say to photographers, more than this, is to advise them to try it.—*British Journal of Photography*.

Lighting Coal Mines From Without.

The frequent and terrible disasters which so often occur in coal mines from the use of lamps—even the best devised so-called "safety lamps"—render any possible device for their exclusion a matter of the utmost interest to this great and important industry. To this end the *Scientific American* suggests that this could be accomplished very easily, it believes, by the generation of the light without the mine (or else at the foot of a ventilating shaft), and its conveyance through tubes to the points requiring illumination. Beams of concentrated light could be sent to any distance through pipes having reflectors suitably placed at bends and angles, or without reflectors, provide the interior of the pipes were smooth and bright. The cost of such lighting would probably be less than the cost of lamps, and the degree of illumination might easily be such as to flood the mine with the brilliancy of daylight.

Another substitute for treacherous safety lamps might be found in electricity, the lanterns being closed so as to make it impossible for explosions to occur. If the insulation of the conducting wires should prove a serious obstacle, it is quite possible that Mr. Edison's "etheric force" would do the work as well without insulation.

ELECTRICITY IN THE MACHINE SHOP.—A correspondent of the *Scientific American* writes: "The electricity produced on an engine, by the friction of a cross belt 100 feet long and three wide, is considerable. By holding one hand up within a foot or so of the belt, and with the other touching a gas jet with a copper wire, we easily light the gas, even if the wire is held an inch from the jet. In some conditions of the atmosphere, it is very painful to walk bareheaded under the belt, although it is some twelve feet or more from the floor. A number of persons have received great relief from rheumatic and neuralgic pains and nervous headache by standing under this belt on zinc or glass plates. The question is this: Can I, with copper or other wire, collect a part of the electricity from the belt and convey it a quarter of a mile so as to utilize it?" Yes, answers our cotemporary, but it will cost more to do so than to generate electricity where it is wanted.

STONEHENGE.—Quite recently a party of civil engineers proceeded to this famous locality in England and were engaged for four or five days in taking most elaborate measurements of the structure, as well as making astronomical calculations. The results of their exhaustive survey have been very striking, astonishing, it is said, none more than the *savants* themselves, and leave not the least doubt about the solar references of the structure; and, further, that it was undoubtedly erected as a temple of the sun.

SOUND MADE VISIBLE.—A sound writer, called an opidoscope, is a new invention. On the end of a two inch tube is pasted a piece of thin rubber or tissue paper. In the center of this is fastened a piece of looking glass, one-eighth of an inch square. Hold this end in the sun and the other end in the mouth, and sing or speak in it. The ray of light reflected from the mirror falling on a white surface describes curves and patterns differing for every pitch and intensity, while the same conditions give uniform results.

Sales at S. F. Stock Exchange.

Table with 2 columns: Date (FRIDAY, A.M., DEC. 31., MONDAY, A.M., JAN. 3., WEDNESDAY, A.M., JAN. 5., THURSDAY, A.M., DEC. 30., THURSDAY, A.M., JAN. 6.) and Stock Prices (listing various stocks like Alpha, Beta, Gamma, etc. with their respective prices).

Table with 2 columns: Stock Name and Price. Lists various mining stocks such as 315 Mexican, 895 Ophir, 1310 Savage, etc., along with their current market prices.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in the Mining and Scientific Press and other S. F. Journals.

Table with 10 columns: Company, Location, No. Amt. Levied, Delinq't, Sale, Secretary, Place of Business. Lists mining companies and their shareholders.

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Table with 10 columns: Company, Location, No. Amt. Levied, Delinq't, Sale, Secretary, Place of Business. Lists additional mining companies and their shareholders.

MEETINGS TO BE HELD.

Table with 5 columns: Name of Co., Location, Secretary, Office in S. F., Meeting Date. Lists upcoming meetings for various mining companies.

LATEST DIVIDENDS (within three months)—MINING INCORPORATIONS.

Table with 5 columns: Name of Co., Location, Secretary, Office in S. F., Amount Payable. Lists recent dividends for mining companies.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

California.

AMADOR. BRIGHT PROSPECTS.—Amador Ledger, Jan. 1: The outlook at the present time for Amador county is exceedingly encouraging. Since the commencement of the rainy season there has been a wonderful revival of mining industry.

considerable item in the way of hauling. LAND SLIDE.—A large land slide occurred on Friday of last week on the Amador canal company's gravel claim, just beyond Jackson Gate. A great portion of the hill, partly undermined by the hydraulic operations and thoroughly saturated by the heavy rains, slid bodily a distance of about 100 ft, entirely covering the "Big Giant" with debris.

nance stack, suggested by comparison of the structures of this character which are thought to be of material advantage. The location of this furnace is at the base of the mountain, at the head of the main street, and is very convenient for the receipt of ores from their mines, as it also is for the delivery to the works of coal and other supplies. The buildings are all included under one roof, the extreme height of which from the ground is 25 ft. The different rooms are of the following dimensions, viz: Engine room 20x27 ft; furnace room 32x35 ft; ore room 16x22 ft, with separate apartment for rock breaker 8x12 ft. In the engine room is located the driving power, consisting of a 25-horse power engine manufactured at the Golden Gate iron works and of neat and substantial pattern. In this room is also located one of Baker's patent blowers, No. 4 in size, and which will easily furnish blast sufficient for a furnace of this capacity. The furnace room contains the stack only and is ample and roomy to accommodate the workmen. The stack is built on a substantial stone foundation, upon which rest the columns that support the diaphragm, all of which are strong and massive and amply sufficient to support the weight which they have to bear. Above the stone foundation upon a tier of fire brick rests the water jacket, which differs from that used in the Deane furnace, and which is in general form of the same pattern as have lately been introduced in the smelting works of the Richmond company in Eureka, Nevada.

NEW COSO.—This company is still engaged in prosecuting work upon their mines with utmost energy and activity, having as large a number of men employed as can be worked to advantage. They are sinking and drifting in so many places that it is really confusing and bewildering to a mining novice to explain the different points being explored.

NEVADA.

OSCEOLA.—*Foothill Tidings*, Jan. 1: This old mine, situated over on Squirrel creek, now under the management of Mr. John T. Rodda, is one of those sulphuretted lodes which will be brought into prominence by the successful practical working of the Fryer process. We learn that Mr. Rodda is having a lot of his rock tried by the Fryer method and feels sanguine of making it a paying mine.

EMPIRE.—Last week this mine produced 213 tons of ore and the mill reduced 240 tons. The ore in the south drift on the 10th level shows a slight improvement.

Not much in the way of local items transpiring these days. Everybody waiting to see what the completion of the railroad and the practical working of the Fryer reduction process will bring.

EUREKA.—The clean-up of this mine for five days of last week gave 175 ounces of amalgam. The ground in No. 3 shaft is more favorable and sinking and timbering progresses at the rate of a foot per day.

SAN DIEGO.

JULIAN AND BANNER MINES.—*San Diego World*, Dec. 14: It is so seldom that we have any Julian news in the San Diego papers, that the outside world might think we had necessarily dried up and gone quite out of existence, when in fact the contrary is the case. We hold our own in the matter of population, and so far as I am personally concerned, also hold my own (inasmuch as I came here broke). I believe also, that I have a great many neighbors who are correspondingly happy.

Laying all jokes aside, it may be truly said that our farming population have not only increased in numbers, but are generally in a more thrifty condition, having, in a great many instances, built comfortable houses and barns. Their stock of cattle, hogs, sheep, horses, etc., have increased in both numbers and value; they have invariably had good harvests and remunerative prices for their products; therefore I must say, in so far as our farming community is concerned, we are prosperous.

However the mining system has not advanced as much in the past year as we had hoped for.

There is a great deal of prospecting done at the present time in this mining region.

The wonderful Tom Scott mine made an immense clean up a few days since, the crushing consisting of three tons of rock. It is reported in town that an immense explosion had taken place in this mine, consisting of a spontaneous combustion of about fifteen pounds of giant powder at the bottom of the shaft, near which two men were working, the result of which has not been truthfully made known to your correspondent at this time.

The Pride of the West had a crushing a few days since of eighteen tons of ore, the result of which was \$46 per ton.

There was a lot of rock crushed from the Big Blue that paid about \$50 per ton.

In the Canon, the Hidden Treasure had a clean up of about \$8 per ton.

The Ella mine is being pushed ahead with energy, and the outlook is very promising.

The Madden mine has been leased by George Cooper and others, and they have struck a fine body of ore.

Work on the Mammoth tunnel has been suspended for a few weeks past, but work will be resumed on the first of the month with renewed energy. This will do more toward developing the country than all the balance combined, tapping, as it will at great depth, the principal ore chimney in this gold system.

There is a considerable prospecting being done here at present for mica, in large quantities, with what result deponent saith not.

Nevada.

WASHOE DISTRICT.

LADY BAYAN.—*Gold Hill News*, Dec. 30: The pump station is completed at the 500-ft level, and sinking the main shaft was energetically resumed last Tuesday morning. The main south drift on the 300-ft level is being steadily advanced, the face in ore of good character. The upraise from the 380-ft level is also in ore. The main south drift on the 380-ft level is steadily advancing, the face in quartz of a very encouraging character. The main southwest drift on the 170-ft level is looking much more promising for an ore development than it has for some time past.

LEVIATHAN.—All work at the 420-ft level is discontinued at present, in order to concentrate all forces upon the sinking of the main shaft deeper. The shaft is to-day down to the depth of 450 ft, and at 500 a level is to be opened to prospect and work the mine at that depth. There is but little doubt that the fine vein of ore already developed at the 420-ft level extends deeper, and will be intersected by the proposed new level.

ORIGINAL GOLD HILL.—Daily yield, 20 tons of ore from the south ore body. The breasts and stopes are looking finely with plenty of ore in sight to last for months. Work in the north drift is suspended at present on account of foul air. The Hope mill is running steadily on ore from this mine, crushing twenty tons a day. The pulp assays average from \$30 to \$40 to the ton, and the first clean-up of the mill will be made to-morrow.

BULLION.—Sinking the main incline is going forward steadily, the bottom in good working ground. Burleigh drills are being placed in the face of the north drift on the 1700-ft level. These drills will add greatly to the speed and comfort in working that portion of the mine.

CHOLLAR-POTOSI.—Daily yield, 60 tons of ore, the assay value of which is \$28 to \$30 per ton. The new combination shaft is now down 500 feet.

GLOBE CONSOLIDATED.—The face of the main south drift on the 350-ft level is showing some very good ore, although it is in spots, it appears to be gradually becoming more concentrated and of a better quality. The north drift on the same level is also looking quite encouraging.

NORTH CARRON.—The ledge is developing finely on the tunnel level, and promises a much better ore formation than was at first expected.

CONSOLIDATED VIRGINIA.—Daily yield, 500 tons of ore. Owing to the mill being unable to crush it, and the teamsters being unable to haul it to the mills, the supply of ore has been temporarily reduced to the above amount. The ore-breasts and stopes throughout the mine continue their regular yield of rich ores, and show no signs of diminution whatever. The mills are running up to their full crushing capacity, and the regular dividend may confidently be looked for, although it may not be quite so large as heretofore, owing to the late start in the month of the mills.

OPHIS.—The new pumping and hoisting engines are working splendidly. The flow of water is now readily taken up by the pumps at the 700-ft level. In the shaft it is reduced to 30 feet below the 1500-ft level, where it is allowed to remain pending the reparation of the drifts and winzes on that level; these drifts are badly caved, as are also the north and south winzes, extending downward from the 1500 to the 1600-ft level. Both these winzes are closed, so that it is impossible to yet ascertain the amount of actual damage done. The main drift on the 1600-ft level is also badly caved, and the east shaft is full of water, which will have to be taken out with the air engines run by the compressors as soon as work can be comfortably resumed at that point. The erection of the incline hoisting machinery is making good progress.

JULIA CONSOLIDATED.—The 1600-ft station is nearly completed, ready to start a drift to cut and prospect the ore at that point. The main drift on the 1400-ft level is steadily advancing, the face almost entirely in quartz and low grade ore. The character of the quartz encountered at this point is very encouraging. It is seven feet in thickness, and bids fair to lead to more and better ore deposits.

KOSATH.—Sinking the south winze below the 200-ft level is making good progress, the bottom still in quartz and ore of a good quality. Everything in and about the mine is in good working condition.

CALIFORNIA.—Sinking the C. & C. shaft is making excellent progress, the rock in the bottom blasting out finely, and the work being pushed with all possible energy. The erection of the California mill is going forward as fast as men can perform the work and do it well. It will be ready to run in about twenty days. But little work is being done in the mine, owing to the want of dump room.

OVEMAN.—Cleaning out and repairing the main shaft below the 1100-ft level, preparatory to resuming sinking, is making good progress.

ROCK ISLAND.—The quartz and ore in the south drift, on the 650-ft level, is showing more of an improvement as the drift gradually progresses to the southward.

EUROPA.—Yesterday morning the face of the main west drift on the 320-ft level penetrated the east clay porphyry, and passed into fine white quartz of a very encouraging nature. The main ore vein cannot certainly be very far away.

SERRA NEVADA.—Sinking the main shaft is making rapid headway. The tank station at the 1200-ft level is completed, and the main south-

west drift, on the 1000-ft level, is steadily advancing, the face in soft ledge material.

NORTH CONSOLIDATED VIRGINIA.—The rock in the bottom blasts out well, and although the flow of water is steady, yet it is not strong enough to at all interfere with the headway. The machinery works well.

DATTON.—The 500-ft station is completed and a drift started to cut the ledge at that point. Sinking the main shaft has been resumed and is making excellent headway.

BUCKEYE.—The ledge is still showing very promising in the bottom of the winze south of the main shaft on the 500-ft level.

CAWSON POINT.—Daily yield, 425 tons of ore, keeping the mills all steadily running. The main south drift, on the 1600-ft level, is steadily advancing to connect with the south winze from the 1500-ft level. This winze is also making good progress, the bottom still in ore.

IMPERIAL-EMPIRE.—Daily yield, 40 tons of ore. The ore breasts show a slight improvement over last week. The north drift on the 2000-ft level is showing a decided improvement during the past few days, and the appearances are very favorable for ore developments in that portion of the mine.

SOUTH COMSTOCK.—The material in the face of the cross-cut has become considerably softer and of a more favorable character during the past week, showing occasional streaks of quartz giving low assays.

BALTIMORE AND AMERICAN FLAT.—The new station at the 1050-ft level is completed and a drift started to open and prospect the ore vein at that point.

AMAZON AND GLASGOW.—The main shaft is down 66 feet below the second station level, with occasional stringers and feeders of lively quartz and ore coming in, although the pitch of the feeders appears to be much nearer perpendicular than was shown by the dip of the ledge on the levels above.

SULLIVAN.—A drift has been started south on the ore vein at the junction of the tunnel and shaft. The ore in the face of the drift is becoming more concentrated and is of a better quality than any heretofore encountered.

LEO.—The face of the south drift from the bottom of the winze below the tunnel level is still in good ore. The cross-cut from this drift is also in ore of a better quality than has heretofore been encountered.

JUSTICE.—Daily yield, 30 tons of ore. This ore is being taken from the 400 and 600-ft levels and is of a good milling quality.

NEW YORK CONSOLIDATED.—Prospecting the 800-ft level is still vigorously prosecuted, with good prospects of ore developments ahead.

NEVADA.—The main north drift following the course of the ledge is steadily advancing, without change. The winze being sunk below the level of the east cross-cut from the south drift is developing some very favorable spots of ore.

SUCCESS.—The water is again nearly extracted from the shaft, ready to resume sinking. The north drift and west cross-cut on the 550-ft level are each steadily advancing, the face of both in much softer and more favorable ground.

PROSPECT.—Sinking the main shaft is going energetically ahead, the bottom in good working ground.

Arizona.

LOCAL AFFAIRS.—*Arizona Miner*, Dec. 25: Thomas Gardner came in from the Trench mine on Thursday. Twelve men are now at work and more will be as soon as he returns with necessary tools. Ore is being taken out of two tunnels—one run from the surface, and another from the bottom of a shaft, about one hundred feet down. We particularly inquired of him about the quantity of ore, and he promptly replied that it was plenty and rich. Smelting will soon commence.

Workmen have been put on the San Xavier, and within a few months that mine will be made productive.

Mr. E. N. Fish is now on a trip with Dr. Bronson and Maj. Blakeney to the Patagonia, and Governor Safford will meet them at the mine.

Joseph Collingwood writes us that Nimau & Nash's mill at Stoneman, between Florence and Pinal, is about ready to start up.

Dr. C. Lord has sent Mr. Libby, a machinist, to Apache pass to examine and report upon the condition of a 10-stamp gold mill that has been lying idle there for some years, with the view of turning it into some practical account in this neighborhood.

D. C. Thompson has been in this week, from the Ostrich mill and mines about there, and reports as favorably as we think a man ought. He says the practice of exaggeration is bad, and that he will not encourage it, but is entirely contented with the show of ore in that section both as regards quality and amount.

Colorado.

BURNING OF THE STEWART REDUCTION WORKS.—*Colorado Miner*, Dec. 25: About two o'clock last Sunday morning, the alarm of fire was heard in the streets, and it was soon known that the large silver mill of the Stewart silver reduction company was in flames! Crowds hurried to the spot; the Georgetown fire company had their apparatus early on the ground; everybody worked with a will; but the consuming fire had secured a headway that no power could control, and in a short time the grand establishment, with its complicated and expensive machinery, was in ruins. Four years ago, the same wild alarm rung out on the stillness of a Sabbath morning, and the flames swept away the predecessor of this mill; then it was a heavier blow than now to our mining interests, but the feeling of sympathy with the owners of

the works is as great now as then. In rebuilding the works, Mr. Stewart had taken every precaution against disaster from fire, and the mill might have been termed safe in this respect, and it was only some utterly unforeseen accident, such as that which happened, that could have wrought the ruin that has occurred. The mill had been closed for Sunday, according to the usual custom; and there were but five men about the place, cleaning up on different floors, when the headlight in the battery room exploded, scattering the blazing oil upon the dry pine timbers; three of the men, as soon as they could reach the spot, commenced fighting the fire with ore soks, while the other two rushed for water and the hose. Before water could be got on, however, the flames had spread in the dry pine beyond the control of those who were fighting them, and as the fire leaped along under the roof, it was soon a foregone conclusion that the building was doomed. We knew nothing of the fire until the next morning, but many who were present have spoken to us in the highest praise of the exertions of the firemen and other citizens to save the building and adjoining property, which undoubtedly resulted in preventing the destruction of the office and melting and assay department, and the new building in which there is about \$10,000 worth of machinery, and bullion-producing by the leaching process is still going on. The loss involved by this fire is in the neighborhood of \$100,000, upon which there is an insurance of \$60,000.

The closing of the Miners' national bank was in accordance with orders from stockholders in the East who were in control. The cashier, Mr. Phelps, wishes us to return thanks on behalf of the bank to the business men of Georgetown, who so generously came forward, not only with the expression of sympathy, but material aid.

Utah.

PARK CITY MINES.—*Salt Lake Tribune*, Jan. 1: The latest news of importance is that the Ontario company have rented the Marsac mill, and intend running that and the McHenry mill (twenty stamps each), so that the yield of bullion from that mine will be doubled, commencing with the New Year. The yield of ore for the next year will be quadrupled. Several new locations were opened during the past summer—supposed to be on the Ontario lode and some of them are promising veins. Many other locations were opened in various parts of the district, which promise an abundance of ore. The greater portion of the ores of the surrounding hills are smelting, and a smelter is of the very first importance to the miners, and would pay well. There is plenty of wood and coal in the immediate vicinity, and during material also.

The gangue of most of the mines on the ridges extending towards the Cottonwoods is an ochre, containing a large percentage of iron, yellow and red oxides, while much of the best ore is a carbonate of lead mixed with oxide of iron, with all the forms of limestone, so that it may be said the lodes themselves contain their own fluxing material. In five years more this district will number its good paying mines by the dozen.

The Ontario is situated near the eastern terminus, and in a depression of the long mountain ridge that once extended from the Oquirrh to the Uintah chain of mountains, embracing Little and Big Cottonwood and American forks. This ledge was mineralized (so far as known and explored) about ten miles in width by thirty or forty in length.

It is believed by those who have carefully examined the subject, that American fork, Little and Big Cottonwood and the ridge extending through Parley's peak, were once on an unbroken chain of the Wasatch, and that the canons that now extend north, south, east and west from the summits, were torn out by the receding waters of what was once a vast inland sea.

The Knickerbocker mine has had a very strong flow of water to contend with for some time past, in fact one of the largest pockets yet found on the line of the Comstock. However, the pumping machinery is getting the better of it, and there are undoubted signs of a rapid draining of the whole so as to permit the resumption of work on the 600 and 700-ft levels.

The latest advices from Wrangel state that the snow lay three feet on a level and the cold was intense. The Stickeen river was frozen. A party of men were one month reaching Wrangel from Telegraph creek. The trip occupies about one and a half days in the summer season. The animals are all doing well, and a large immigration is anticipated in the spring.

The shaft repairs in the Hale & Norcross mine are completed down to the head of the main incline, and work has been resumed at all points on the 2200-ft level, the same as before the suspension for repairs. The lower drifts and levels were all found in the best working condition possible, and everything is again running all right.

The water has not yet been drained from the Gould & Corry shaft, on the 1700-ft level; consequently no work can be done in that portion of the Best & Belcher mine as yet.

The Cheyenne Leader estimates that 10,000 people have gone to the Black Hills mining region during the last three months. They have come from all directions—from the South, Utah, California, Nevada, Idaho and Montana.

Prof. Rogers' Report on the Bonanza Mines.

In the annual report of the Director of the Mint, is incorporated the following report of Prof. R. E. Rogers on the Consolidated Virginia and California mines:

Hon. H. R. Linderman, Director of the Mint—Sir: In compliance with your request of November 1st, 1875, that I would furnish you with a report of my examination of the Consolidated Virginia and California mines on the Comstock lode, at Virginia City, Storey county, Nevada, with my conclusions as to their probable total yield of gold and silver, based upon their present explored extent, and the quality of their ores as ascertained by assays, I would respectfully make the following statement:

My explorations through these mines were accomplished during two prolonged visits, made on separate days—one in company with yourself, and the other under the guidance of the Superintendent. This was a work not merely of a general or superficial character, but of careful and laborious investigation, in which all the galleries and cross-cuts on the different accessible levels were critically inspected and scrutinized with reference to the body of ore that might be within view, and its appearance in point of quality. Having an attendant along who carried bags for their reception, I gathered at frequent intervals, and labeled them, an extensive collection of specimens for assays. The following

Brief Description

Of the position of these mines, which lie in the same general line of ore body that constitute what is commonly known as the "Comstock lode," may aid the mind in forming a better idea of their nature, and will serve to explain the principles which have guided the engineers and Superintendent in laying off the work for exploring their extent and mining the ore. The surface of the whole country around Virginia City is rough, broken and hilly. At this immediate locality there is a long lofty range extension of the Washoe mountains, at places many hundred feet in elevation above the plain, whose steep slope to the valley below faces toward the east, and whose general trend is north and south. About midway up the slope the croppings of the ore of these and of many other mines of the lode are visible.

The First Excavations

Which were made in the early workings here were upon these croppings, but in due time it was discovered that the ore-body dipped toward the east in a measure parallel with the surface of the mountain side, though having no physical nor geological relation to that superficial outline. As a consequence of this discovery, the present shaft, known as that of the Consolidated Virginia mine, was sunk at a point down the slope many hundred feet to the east of its outcropping. It is from this shaft that all the ore from the Consolidated Virginia and California mines has been lifted, until the recent fire, which destroyed the hoisting machinery. The slope of the ore-body of these mines is from forty to forty-seven degrees toward the east, and its trend or line of length is nearly north and south, or in the direction of the line of the containing mountain-like range. This being the relative position of the vertical shaft to the sloping body of ore, it is evident that no ore would be looked for in the descent until several hundred feet had been reached. In point of fact, 1,300 feet of rock were passed through before any horizontal drifting was done to intercept the ore.

Ore of Profitable Richness

Having been met with at this level (the 1300-foot level, as it is called), the shaft was sunk to the depth of 100 feet more, and a similar horizontal drift run in to test the continuance of the ore. Finding that the ore body on the 1400-foot level was undiminished in abundance and richer than that on the 1300-foot level, the shaft was carried down a second hundred feet, with the view to explore a 1500-foot level; and finally, under the encouragement afforded in every foot of descent, a double "winze" has been put down recently in the California mine to a depth of 110 feet below the 1550-foot level. The shafts having been sunk successfully to the depths here indicated, the principle adopted for exploring and probing the extent of ore on each level was to run galleries and cross-cuts. The extent to which this judicious system has been carried is indicated on the four certified maps of the workings of these mines accompanying the statement furnished you by James G. Fair, superintendent of the two mines.

In the brief narrative of the progressive development of the mines above given; it is seen that by this only safe and satisfactory mode of testing the length, depth and width of the ore-body, it has been rendered possible to block out in cubes of a square each the metal bearing mass, so far as penetrated to view, and to thus reach

An Approximate Estimate

Of the probable aggregate ultimate product of gold and silver from these mines; since the maps are constructed to a scale they exhibit clearly the quantity of ore that has been removed from the mines, relatively to the amount that remains untouched, assuming that the system of cross-cuts which penetrate the ore body give correct data for such conclusion. In speaking of these mines they have been referred to here in the language common to both. The line which divides them is only a property boundary, there being two companies, but under one management. The ore is of the

same character, and the east and west walls identical for them both.

The claim of the Consolidated Virginia mine is 710 feet long, and that of the California mine is 600 feet. The explored width of the ore-mass on the 1500-foot level averages 250 feet. The west boundary wall is that of the mountain rock eyenite. The east boundary, which can be scarcely termed a wall, is ferruginous clay. The ore-body itself consists of a semi-crystalline, somewhat granular matrix of quartz, sometimes compact, but more commonly friable and easily crushed, crossed and coated over with whitish clay, containing the precious metals associated with several base metals and a variety of other substances. The nodular and rocky masses scattered through the lode—at times of magnitude to form what is termed a "horse"—is a potash feldspar, and named by the miners porphyry. The following may be stated as the

Composition of the Ore Mass.

Quartz, the largest constituent, constituting the matrix or "gangue;" gold, metallic; silver, metallic; silver glance, or sulphide of silver; polybasite, (silver, copper, iron, zinc, antimony, arsenic, sulphur); stephenite, (silver, copper, iron, antimony, sulphur); blende, (zinc, sulphur); galena, (silver, lead, sulphur); horn silver in small amount, (silver chloride); almina, (as clay); carbonate of lime; sulphate of lime. In this ore the gold is in the metallic state. The silver is metallic and also as sulphide and chloride, and likewise in the complex mineral forms above named. The iron, copper, lead, zinc, antimony and arsenic are in a condition of combination with sulphur as sulphides of those metals. The silica and clay are simply in mechanical association with the above. At the works of the mines, as well as at the mills, all the ore delivered is sampled as fairly as possible, that the averages may be obtained for assays for the purpose of adjusting the accounts between the mines and the mills. With the data in our possession and the maps before me I may venture upon the following calculations and estimate the

Total Ultimate Product

Of the gold and silver of the ore body of these two mines: On an inspection of the official surveys exhibiting the galleries and cross-cuts, it would seem fair to conclude that with proper allowances the ore body equals an amount which, taken at the actual assays, would give as the ultimate yield of the two mines, \$300,000,000; but to guard against a chance of over-estimating, I take the assays at one-half that ascertained, which will place the production at not less than \$150,000,000. With a view to make due allowances for interruptions to the continuity of the body of ore which lies between the 1500 and 1400-foot levels, the whole of the ore contained between the 1400 and 1300-foot levels is thrown in, and not embraced in the estimate. It may also be stated that the very promising ore developments below the 1550-foot level, the assays of which run very high, have also been omitted from my calculations. All of which is submitted by,

Very respectfully, your obedient servant,
November 15th, 1875. R. E. ROGERS.

Rainfall.

A London paper says: "In the Paris *Bulletin International* for June 30th last, Professor Raulin, of Bordeaux, gives the results of an examination of a comparison of the gross amount of the rainfall for the ten years, 1851-60, with that for the ten years, 1861-70, from which it is shown that, as regards the southern half of France, the rainfall during the former of these decennial periods exceeded that of the latter at forty-six out of the fifty-three stations at which observations were made for twenty years. A similar distribution of the rainfall during those two decennial periods appears to have taken place, with few exceptions, over a large area, embracing the British Isles, France, Germany, Italy, Spain, the basin of the Mediterranean, and Algiers. The point is an interesting one, and we hope that meteorologists will inquire how far the rainfall observations of their respective countries agree with the result obtained by Professor Raulin for the southern half of France."

Such facts as these go to show how little is known of meteorology and its laws. Most of our newspapers have had much to say of late years about the connection of forests with rainfall. That there may be some trifling influence in favor of more rain with more trees in some cases is possible, but here we have an average increase of rain in a decade from a part of the world which in the same time would show a decrease of woodland. Woodland naturally exists to the greatest extent in those countries where the precipitation of moisture is favorable to the ripening of seeds and their subsequent germination. The woods are a consequence, not a cause, of the moist climate. But the fact of the rainfall in comparison with wood-clearing being found at one time to favor a denudation theory, and at another time to oppose it, should be evidence that there is little connection between the two.—*Forney's Weekly Press*.

SAVE HEAT.—Our economical readers should remember that the surplus heat wasted from a common stove will, if conducted through a drum into another room, warm the room as much as a small stove would, and will compel the fuel to do double the duty and give double results.

Quicksilver Product.

It is well known that the production of quicksilver has been largely increased in California during the past few months. The following statement, furnished by a correspondent of the *Bulletin*, will show what one of the leading quicksilver companies has accomplished during the past year:

The Redington quicksilver company, during January, February and a portion of March, 1875, were not producing quicksilver, being engaged in adding to and changing their reduction works. In March they got their reduction works well under way again, and their reduction for the current year ending December 31st, 1875 (say ten operative months), has been 8,080 flasks of quicksilver. Since September last their production has been upwards of 1,000 flasks per month, at which figure it closes the year. This increase of product is in a great degree due to the marked success of two new furnaces for the reduction of fine ores or Tierras. These furnaces are the invention of the superintendent of the company, Charles E. Livermore, and they may safely be said to introduce a new element into quicksilver reduction, making it possible to profitably utilize material largely produced by all quicksilver mines, but heretofore handled, always at no profit, and frequently at an absolute loss. The Redington quicksilver company have now in active, continuous operation four of the Knox & Osborne patent furnaces, and two of the Livermore patent fine ore furnaces, their total reducing capacity being upwards of 120 tons of ore per day. This large quantity of ore is easily yielded by the upper levels of the mine, none having yet been drawn from below the 200-foot level. The mine has, however, been opened by shaft to the depth of 400 feet, and consistent prospecting work is maintained in advance, so as to insure a supply of ore for at least two years ahead of requirements. The company employs 300 men in its various departments, and has very extensive works, the whole affording a most striking example of what careful management on a strictly business basis will accomplish. Such results have been attainable by reason of the fact that the management of the mine has been carefully attended to by the comparatively few individuals who own it, and the property though incorporated as a stock company, has never been on the stock market for sale or speculation, but has always been handled as a legitimate operative business. It has, during the past year, enjoyed a profitable contract with Messrs. Flood & O'Brien to supply them with 500 flasks per month, and this contract is still in force. The capital stock of the company is \$1,260,000, in 1,260 shares of \$1,000 each, and regular monthly dividends of \$30 per share have been paid thereon during 1875, or \$37,800 per month, making a total of \$453,600 divided profits for 1875. Besides this, about \$125,000 has been invested in new land purchase, buildings, machinery, new reduction works and other appliances, adding largely to the value and future productiveness of the property.

Eureka Bullion for 1875.

Our mines and smelters have been doing extremely well the past season, and are still looking and yielding better than at any previous time in the history of the district. From Mr. Hill, Wells, Fargo & Co.'s agent at Palisade, we learn that there have been shipped from here during the present year 22,124,146 pounds of crude bullion. This is exclusive of the refined bullion forwarded by the Richmond company, and which must have aggregated a very considerable sum, though we have not the exact figures. Our principal mines are the Eureka Consolidated, Richmond, K. K. and Atlas, and nearly all of the vast quantity of bullion noted above came from these mines. The largest shipment was made in July, amounting to about 3,000,000 pounds. During the present month, up to the 18th, the shipments aggregated 1,687,876 pounds, which is considerably in excess of shipments for the same number of days for any prior period. It will be seen from these enormous figures that Eureka is on the high road to a great and lasting prosperity. With the advantages furnished by the construction of the Eureka and Palisade railroad we shall expect our bullion product to be nearly doubled in 1876. Eureka rests on a solid foundation, and, to our notion, a brighter future awaits her than any other mining town on the Pacific Coast.—*Eureka Sentinel*.

A HINT TO MINERS.—Quartz and gravel, as well as placer, worthy of thought and action, is contained in the following, clipped from the *Placer Herald*: Trueh & Bellard laid out a portion of their placer claim as a fruit garden. They planted some 300 or 400 trees of various kinds, and also strawberry and gooseberry plants. Possessing first class irrigating facilities the garden has thrived surprisingly. The strawberry bushes have yielded an abundance of fruit during eight months of the year, while the trees have grown rapidly. Next season it is expected that most of the trees will bear fruit. In a similar way nearly all our foothill slopes may be covered with beauty. A short time ago the plot of ground to which we have referred was as barren looking as the rest, but a small stream of water has proved the soil to be fertile in the extreme.

HIGH VELOCITY OF WIND.—The Signal office at Mt. Washington recently reported a wind velocity of 156 miles per hour. This is the highest velocity recorded at that station.

Prizes in Industry and Agriculture.

The Societe d'Encouragement of Paris has recently published its list of prizes offered from 1876 to 1881, both inclusive. It may be mentioned that this society bestows annually a gold medal bearing the likeness of some man who has achieved a high reputation in art or science, or is the originator, whether French or foreign, of works which have exercised the greatest influence on French industry during the six preceding years; in 1873 this grand medal was awarded to our own countryman, Sir Charles Wheatstone.

Although all the subjects are open to foreigners as well as natives of France, many would of necessity be confined to the latter. The following items from the long list are likely to have an interest in this country:

A prize of 200 francs is offered in 1880 to the author of the most important improvements in the material and processes employed in civil engineering, architecture and public works.

A prize of 2,000 francs is offered in 1879 to the inventor of a machine for combing short staple cotton which has been brought into practical use.

A prize of the same amount is offered for 1880, for a machine for cutting files of all kinds automatically, and which shall have worked for at least three months.

A prize of the same amount is proposed to be awarded in 1877 for the invention of any efficient means of stopping the vibrations caused by steam hammers, and other tools acting by percussion, from being propagated beyond the works in which they are employed.

Prizes of the same amount are offered in 1878 and 1879 for the industrial application of oxygenated water, and for the economic preparation and application of ozone; and in 1876 for fixing the nitrogen of the atmosphere in the form of nitric acid, ammonia, or cyanogen, the object being to obtain practically some compound of nitrogen cheap enough to use in making manure from the nitrogen of the atmosphere, to the exclusion of animal matter.

A prize of 6,000 francs is proposed for 1878, for a theory respecting steel, founded on actual experiments, and resulting in improved means of directing the manufacture of steel.

A prize of 3,000 francs, set down for 1880, for the disinfection of the residue from gas works.

One thousand francs are offered in 1880, for an apparatus capable of producing high temperature in home workshops rapidly and economically.

A prize of 2,000 francs is announced for a method of preventing soot adhering to chimneys so that they may be completely and easily cleaned.

All memoirs, models, etc., must be lodged with the secretary of the society before the 1st of January of the year in which the prize is to be awarded. Full particulars will be found in the August number of the *Bulletin* of the society, which is in the reading room of the society of arts.—*Journal Society of Arts*.

Damages from Hydraulic Mining.

An adjourned meeting of citizens of Sutter and Yuba counties was held at Marysville, Friday afternoon, to consider the effects of hydraulic mining in the mountains upon the plains below, and to consult and advise as to what remedy can be had. The meeting, says the *Appeal*, was largely attended, and by many of the most prominent farmers and citizens in the two counties. The grievances of the people, present and prospective, were presented and contrasted, and the more the matter was investigated the more perplexing and difficult the remedy appeared. Various expedients were suggested, and no individual present was prepared to advise the best course to adopt. All could plainly see that hydraulic mining was destroying property a thousand times more valuable, but how could it be stopped? As one speaker said, who present here among the sufferers has the moral courage to say mining shall be stopped? The mining interests of the State are large, and are owned principally in the cities. To ask the legislature to destroy it will arouse the opposition of the owners. Turn the matter as we may, and look at it from the valley or mountain standpoint, and we find it is beset with the greatest of difficulties. If any single miner runs tailings upon a farm below, the owner of the mines is liable and could be made to pay damages. But the damages we complain of is caused by thousands of miners, and has been going on for over twenty years. Who shall we sue or prosecute under a penal law? The action of the meeting finally culminated in the appointment of a committee to draft a bill to be presented to the legislature, making it unlawful to throw mining debris into Bear river, Yuba river or Feather river, or their tributaries, and making any and all hydraulic mining companies so flowing debris in said streams answerable in proportion to the amount so thrown into said streams for the damage caused thereby. Also, to ask the legislature to investigate by appropriate means this subject, in order that some plan may be adopted by which the destruction occasioned by hydraulic mining on said streams may cease. And to ask the Federal government for appropriations to keep open for commerce the navigable streams of the State rendered unnavigable by hydraulic mining. The meeting adjourned till Saturday, January 8th, at twelve o'clock, to hear the report of the committee and take action thereon.

USEFUL INFORMATION.

A Novel Device.

In Northern cities, where the cold is severe, serious annoyance and no little danger often occurs from the freezing of water pipes. The *Scientific American* enters the following word of caution, and describes a very ingenious device for meeting such emergencies:

When a pipe from the street freezes, the range fire should be at once extinguished, as otherwise the water back will either blow up or be burnt out; in the former case serious damage is possible. Last winter the plumbers dug up the streets, and built fires over the supply pipes, and went through other operations, which generally resulted in a bill of from eighty to one hundred dollars. At the present time, if an invention which we recently examined proves as useful as appearances indicate, the cost of such proceedings will be greatly reduced. The apparatus is a small steam boiler, heated by a pan of charcoal beneath it. The hot water—not steam, as in this machine a constant supply of water against the ice is found to thaw the same quicker, paradoxical as the fact may appear—is forced into a small rubber tube, the end of which has a metallic tip, and around which stout copper wire is spirally wound. This wire is held in a coil in a rotating wire cage, and freely unwinds as it is pushed into the pipe. When the end meets the ice, the pushing by hand is stopped, but is continued by an ingenious spring arrangement. By the spiral wire the tube is literally screwed into the ice, which is softened and melted before it by the continual stream of hot water issuing from the end of the pipe.

We might add that there is still an excellent field for invention in other devices of the same description; and at the same time we might suggest, to inventors already in possession of similar patented apparatus, that now is the time to bring them to the notice of the people.

THE ORIGIN OF MAHOGANY FURNITURE.—The facts regarding the first introduction of mahogany as material for furniture, though long known, are not the less interesting: A physician of the name of Gibbons, who resided in London, received in 1724 a present of some mahogany planks from his brother, a West India captain. Dr. Gibbons was then building a house, and he desired his carpenter to work up the wood. The carpenter had no tool hard enough to touch it; so the planks were laid aside. The doctor's wife, after the house was finished, wanted a candle box, and the mahogany was again thought of. A cabinet maker of the name of Wollaston was applied to; and he also complained that his tools were too soft. But he persevered, and the candle box was at length completed—after a rude fashion, no doubt. The candle box was so much admired, that the physician resolved to have a mahogany bureau; and when the bureau was finished, all the people of fashion came to see it. The cabinet maker procured more planks, and made a fortune by the numerous customers he obtained. From that time the use of mahogany furniture went forward among the luxuries; and the drawers and bureaus of walnut tree and pear tree were gradually superseded in the houses of the rich.

EBONITE.—The use of ebonite, one of the newer preparations of india rubber, is constantly increasing, on account of its better applicability to many purposes in the arts than its near ally, vulcanite. The two substances are quite similar, being composed of india rubber and sulphur, with some preparation of gutta percha, shellac, asphalt, graphite, etc., although these latter are not essential. In vulcanite the amount of rubber does not exceed twenty to thirty per cent., whereas in ebonite the percentage of sulphur may reach as high as sixty. An increased temperature is also required for its preparation. The approved formula consists in mixing together one hundred parts of rubber, forty-five of sulphur and ten of gutta percha, with sufficient heat to facilitate the combustion. In manufacture, a sufficient quantity of this mixture is placed in a mold of a desired shape, and of such material as will not be affected by the sulphur contained in the mass. It is then exposed to heat of about 315° and a pressure of about twelve pounds to the square inch for two hours. This is done most readily by placing the mold in a steam pan, where the requisite pressure and temperature can easily be kept up. When cold, the ebonite is removed from the mold and finished and polished in the usual manner.

A new method of warming first-class carriages in express trains has been adopted in Bavaria. A special van is attached to the train, and contains a powerful "calorifere," and the heated air is conveyed to all the carriages of the train by means of india rubber tubes. The experiment with first-class carriages is reported upon so favorably that the authorities have determined to apply it to all the carriages on the Bavarian line, and it is expected that it will soon be adopted on all the German railways.

ROSIN.—Common rosin, the non-volatile portion of crude turpentine, was originally termed "colophony," from Colophon, in Ionia, where rosin was first produced by the ancient Greeks. It is sometimes so called in the present age.

PRACTICAL SPIRITUALISM.—Dr. E. P. Miller, an intelligent physician of New York, has become an avowed and ardent advocate of the "spirituality" of the Eddy tricksters of Vermont. The doctor is so certain of the heavenly power of one of the Eddy female performers that he has publicly offered a challenge or test exhibition, under a wager of \$5,000, that her "manifestations" are genuine, and agrees to leave the matter to the decision of a committee of twelve persons, to be mutually chosen by himself and the acceptor of the challenge. Mr. W. Irving Bishop has accepted the challenge, undertakes to prove that the woman is a fraud, and further, agrees to reproduce all the "materializations" and "manifestations" that she may produce, without any spiritual assistance whatever. He says he has been to Vermont and learned the art completely. He suggests that \$5,000 shall be deposited by each party, the winner to donate that amount to some designated charitable institution. The result of the contest, if it comes off, will be interesting, however it may eventuate.

SHARPENING EDGE TOOLS.—Very few general amateurs have sufficient practice to acquire, or to retain when acquired, the knack of producing perfectly flat facets on their plane-irons, chisels, etc. By the aid of the following simple contrivance, put together very easily, the end may be attained with dispatch and certainty, the shavings leaving the plane with the real professional "whistle." A simple saddle of wood, with a thumb screw and clamp, or dog, for fixing the tool firmly to the work bar. The oil-stone is placed between the cheeks and the tool, so adjusted that the saddle bears with its heels or hinder angles on the bench, the tool, of course, bearing on the oil-stone. The saddle, and with it of course the tool, is then worked backwards over the stone.—*Ex.*

SCREW THREADS.—The thread on a three-eighth inch gas pipe will sustain a weight of 5,000 pounds; on a half-inch pipe, 7,000 pounds, and on a three fourth inch pipe, 9,000 pounds. These facts are important to persons engaged in baling chandeliers, etc.

AQUAFORTIS, applied to the surface of steel, produces a black spot; on iron, the metal remains clean.

GOOD HEALTH.

Longevity.

We are too apt to sneer at the story of such characters as the Count St. Germain and the Baron Munchausen, and Aladdin—they are improbable, as the world goes. But let mankind heed the true laws of hygiene, and it will not be seldom, but frequent, that we shall have to note longevity as great as that attributed to St. Germain. It was common for him to relate the actions, conversation, even to the imitation of the peculiarities of voice, of people that had been dead fifty years, and no one was ever able to account for these incomparable delineations except upon the hypothesis of contemporaneous and actual witness. It is well known that St. Germain would never eat the elaborate dishes prepared for the tables of the courts where he was so frequently a guest, and seldom tasted wine. Although rich, having plenty of servants and the finest diamonds and jewelry, his fare, so far as could be ascertained, for his life was a constant mystery, was composed of oat meal, groats, and some times the white meat of chickens.

In the travels of the writer in the far East, and in intercourse with the old rosicrucians or modern alchemists, it was observed that their diet was abstemious, and composed chiefly of fruit and grains. Even among cannibals the old doctors had every appearance of being in some instances over an hundred years of age. It was noted that these old men never indulged in the orgies they were invited to, but sat or stood as spectators. It is so hard for man to study his own true nature, and it is only grain by grain that the great truths which lie at the foundation of long life and happiness can be gathered.

We are rushing with such lightning speed, in this fast age, that the study appears to be how to condense the whole sum of existence into as few years as possible—or that is the result, for the vital force present is only a positive sum; and if man's life be a rocket, it must be expected that it will be correspondingly short. Every instinct is suggestive of self-preservation, but the philosophy of the nineteenth century is contained in one line: "A short life and merry." F. M. SHAW.

Los Angeles, December, 1875.

CARE OF THE GUMS.—Those troubled with ordinary diseases of the gums should wash their teeth night and morning with a moderately small and soft brush. After the morning ablution, pour on a brush, slightly dampened, a little of a lotion made by mixing one scruple of carbolic acid, rectified spirits of wine two drachms, and six ounces of pure, or distilled water.—*Lancet.*

Mr. GEORGE R. LABAU, 111 years old, as distinctly shown by the records of his christening, attended the State fair at Easton, Pa., last week. The old man is talkative and intelligent, has a fine cheek, shows little emaciation, and can do considerable work without fatigue.

Prevention and Cure.

It is astonishing, to say the least, that everywhere "cure" is recognized before prevention. The old adage "an ounce of prevention is worth a pound of cure," seems to have been forgotten, or at least disregarded by the mass of humanity. Men will search throughout the range of the whole pharmacopoeia, and cast about them all their lifetimes for some chemical or vegetable compound which shall be an effectual cure for some of the "ills which flesh is heir to," while if they should spend half the time in looking for the cause and prevention of this disease, the sufferings of humanity would be mitigated to an incomparably greater degree. And when such a medicine is found, it very seldom affects a cure. Even when the cause and prevention are known, men seem to overlook the fact that the suffering consequent upon the exertion and self-denial necessary for prevention of disease is less than that which follows the neglect to apply the preventive. This substitution of cure for prevention seems to hold precedence where civilization is highest to a greater degree than among less enlightened nations. And why is this? Among barbarous nations more attention is paid to prevention, and the few remedial agents used are simple, and seldom effectual in themselves; whereas, in civilized countries the greater knowledge of science induces men to search more extensively for new and better curatives, and as more and more scientific discoveries are made, the medical field becomes wider and wider. And thus, in this rush after new medical discoveries, the laws of prevention of disease have been overlooked, and left far behind.

Now, viewing this matter as one of the greatest importance to the human family, the next step is to consider how it may be brought to the attention of the mass of the people. The medical men, as a class, do not do it, although it is their legitimate business, because it would not be for their pecuniary interest. But there is one other resource, and one which is adequate to the task. Let the press take hold of the work, and after clearing its pages of all medical advertisements, in their place let it elucidate the common rules and principles of health, and point out the causes of sickness and disease and the methods of prevention, and by so doing it would lose nothing, pecuniarily or otherwise. Let this be done, and the day is not very distant when the swindling practice of the multitude of quacks with which the country is swarming will be at an end, and the people, stronger, both physically and mentally, will adopt for their motto, "moderation in all things."—*Cor. Pnenological Journal.*

BORAX IN COLDS.—A writer in the *Medical Record* cites a number of cases in which borax has proved a most effective remedy in certain forms of colds. He states for a sudden hoarseness or loss of voice in public speakers or singers, from colds, relief for an hour or so, as by magic, may be often obtained by slowly dissolving and partially swallowing a lump of borax, the size of a garden pea, or about three or four grains held in the mouth for ten minutes before speaking or singing. This produces a profuse secretion of saliva, or "watering" of the mouth and throat—probably restoring the voice or tone to the dried vocal cords, just the same as "wetting" brings back the missing notes to the flute, when it is too dry.

TO OBSOURE SCARS.—To obscure, hoil in three quarts of water one pint horseradish, four ounces pulverized alum, and four ounces rock salt. When cold, wet pieces of thick lint therewith, and apply frequently. This will harden and thicken the skin. Persevere for some time, and the effect is certain. On going among friends, dull the shiny appearance by bathing it with a little spirits of hartshorn in water. The first named preparation is best when made newly; it gradually loses pungency and effectiveness, and so when weak must be renewed. With time and care, as above, the redness and peculiar appearance of scars will largely diminish. The person should carefully avoid all irritation of the parts.

BUILDING GROUND.—We want more of a dry earth system. Perfect under-drainage is the first great need of most cities and large towns. Regulations of cellars, and of all other holes below the surface, is the next great study. The proper airing of all sub-structure, because of its proximity to the ground, comes in next for consideration. What can we do to sweeten or purify surface-soil already formed, is another point. The great question of what to do with all refuse so as to keep it out of city soil is the large and momentous subject which must ever present itself to our attention.—*Public Health Association.*

LOOK TO YOUR HEALTH.—Pay but half the attention to the condition of your lungs that you do to the condition of your purse and you will not only prolong your own days, but your children will inherit that from you over which there will be no wrangling, no strife, no false swearing; a treasure divided by nature's own hand, in which your sons and your daughters, the eldest and the youngest, shall "share and share alike."

A FATAL KISS.—The *Albany Argus* says that Miss Kate Noyes, of Lausburg, is in a critical condition from poison, arising from kissing her deceased niece, who died of diphtheria. The young lady had a slight sore on her lip at the time. A swelling commenced in her lip, which soon extended to the nose, and it is feared the difficulty will reach the brain.

DOMESTIC ECONOMY.

The Art of Frying Fish.

Several kinds of fish are fried when small, such as small trout or troutlets, carps, tench, sun fish, pike, pickerel, flounders, white-fish, black and blue fish, perch, porgy, weak-fish, herring, bass, and the like, and smelts, which never grow above the frying size.

When fish or anything else is cooked in a frying pan with just fat enough to prevent it from burning, it is not fried but *sautéed*, there being two very distinct ways of frying. To fry means to cook fish or something else immersed in hoiling fat. To *sauté* means to cook fish or something else with just fat enough to merely cover the bottom of the pan; for instance, small fishes are fried, but omelets are *sautéed*; potatoes are fried, but parsnips are *sautéed*.

Many inexperienced cooks make mistakes on that account; they read in some cook-book that such an article of food is good fried, and set to frying it when it should be *sautéed*, and vice versa.

The fat skimmed from the surface of broth, which is beef-suet, the trimmings of steaks or roasting pieces of beef melted as directed below, are better for frying purposes than lard, not flying all over as lard does.

The fat skimmed from trimmings or from around the kidneys of beef is cut in small pieces, put in an iron pot, and set on a rather slow fire. As soon as it begins to melt, ladle off the melted part and turn it into a stone or crockery jar, which you cover when cold. Put it away in a cool, dry, and dark place. A careful cook never needs lard for frying purposes, but has always more fat than is necessary out of hoiling or roasting pieces, and that skimmed on the top of broth, sauce, and gravies. Some cooks will not take the trouble to melt it when the mistress allows as much lard and butter as is asked for.

It is an error to believe that by using much fat to fry, the articles fried will taste greasy; if there is not fat enough in the pan to completely immerse the objects fried, they will certainly taste greasy. It will be the same if the fat is not heated enough. It is heated enough when jets of smoke ooze out of it, or when, on throwing drops of water on it, it makes a crackling noise.

When the fat is hot enough, the article that is to be fried is dropped into it, and stirred gently now and then with a skimmer. When done, it is taken off the pan with a skimmer and turned into a colander, which should rest on a dish or bowl to receive the fat that may drop from it.

If the article to be fried is not completely immersed in the fat, the part not immersed will absorb fat, and, as stated above, will be greasy; but if there is fat enough to cover it entirely, the intensity of the heat closes the pores, carbonizing the exterior of the article, as it were, and preventing it from absorbing any fat.

If the articles to be fried be tender and somewhat brittle, they are put in a wire basket or perforated double bottom made for that purpose, and the basket is plunged into the fat. The basket is raised when the articles are fried, and held over the pan to let the fat drop; they are then taken carefully out of it, placed on a dish, sprinkled with salt, and served hot.

When the frying is done, the pan is put away for a few minutes, to allow the particles of solid matter that may be in to fall to the bottom of the frying-pan; then it is turned into the jar, gently and slowly, so as to retain those particles in the bottom and it is put away for another time.—*Prof. Blot.*

TO PRESERVE BREAD FOR LONG PERIODS.—Cut the bread into thin slices and bake it in an oven, so as to render it perfectly dry. In this condition it will keep good for any length of time required, and without turning moldy or sour, like ordinary bread. The bread thus prepared must, however, be carefully preserved from pressure, otherwise, owing to its brittleness, it will soon fall to pieces. When required for use it will only be necessary to dip the bread for an instant into warm water, and then hold it before the fire till dry, after which butter it, when it will taste like toast. This is a useful way of preserving bread for sea voyages, and also any bread that may be made too stale to be eaten in the usual way.

FRENCH PANCAKES.—Half a pint of milk, two ounces of butter, two ounces of loaf sugar, two ounces of flour, two eggs. Put milk, butter and sugar into a saucepan to dissolve (not hoil), beat eggs and flour together till quite smooth, then add the other ingredients and mix well. Divide this quantity and put it in four saucers to bake for twenty minutes; lay two pancakes on a dish, spread preserves over, and cover with the other two pancakes. Serve hot.

OXFORD DUMPLINGS.—Mix well together the following ingredients: Two ounces of grated bread, four ounces of currants, four ounces of shred suet, a tablespoonful of sifted sugar, a little salt, and plenty of grated lemon peel. Beat up well two eggs; add a little milk and divide the mixture into five dumplings. Fry them in butter a light brown color and serve them with sauce.

CRISP MUFFINS.—One pint of sifted Indian meal, one pint of milk or cream, two eggs, a teaspoonful of salt, a spoonful of butter or lard. Drop the batter in a hot, greased pan or oven, by spoonfuls, taking care that your muffins do not touch. Let them bake till crisp and brown.



W. B. EWER..... SENIOR EDITOR.

DEWEY & CO., Publishers.

A. T. DEWEY, GBO. R. STONG
W. B. EWER, JNO. L. ROONE

Office, No. 224 Sansome St., S. E. Corner
of California St., San Francisco.

Subscription and Advertising Rates:

ADVERTISING RATES.—1 week, 1 month, 3 months, 1 year.
Per line..... 25 30 \$2.00 \$6.00
One-half inch..... 1.00 3.00 7.50 24.00
One inch..... 1.60 4.00 12.00 40.00

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THE ORIGINAL ARTICLES in this paper are mostly set in solid type, giving in our columns one-third more reading than is contained in ordinary leaded matter.

San Francisco:

Saturday Morning, Jan. 8, 1876.

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POPULAR LECTURES.—The winter course of popular lectures, under the auspices of the University of California and the Mechanics' Institute, commences on Saturday evening next, at the hall of the Institute, on Post street. The course of lectures will be as follows: January 8th, 1876, "Trade Tuition," by A. S. Hallidie; 15th and 22d, "Coral Reefs and Islands," by Prof. Jos. Le Conte; 29th, "Wet Processes in Metallurgy," by Dr. G. F. Becker; February 5th, "Recent Researches on the Lunar Surface," by Prof. F. Soule, Jr.; 12th and 19th, "Domestic Beverages of Different Nations," by Prof. E. W. Hilgard; 26th, "Socrates," by Prof. G. W. Bunnell; March 4th, "Solar Protuberances," by Prof. F. Soule; 11th, "The Metric System," by Prof. John Le Conte; 18th, "Heat—Engines in connection with the Mechanical Theory of Heat," by Prof. F. G. Hesse; 25th, (Subject to be announced), by Prof. W. Ashburner.

The water in the Savage mine is drained down to the 2200-ft level, at which point it is easily held by the pumping machinery, and preparations are being made to resume work in the drifts and winzes on that level in a very few days.

It is expected that the prospecting of the West Belcher mine several hundred feet below the tunnel will be commenced through the old Overman shaft in a very short time.

The Raymond & Ely mine, during the four days ending last week Tuesday, shipped to the mills at Bullionville 349 tons of ore, the largest shipment being made on Sunday—97 tons.

The Mining Debris Question.

A mass meeting of the farmers has been held recently in Marysville, to consider the matter of the damages done to the farms and rivers by the deposition of debris from the mines. The question is one which by the greatness of the interests involved demands careful study and just action. It is sound, as a general principle, that the industries of men should be so adjusted that they may advance evenly and without working hardship and detriment to each other. The way to effect this adjustment is often difficult to determine. No action should be urged hastily or without careful weighing of all the considerations involved. The study and research necessary to wise action should not be shrunk from, because upon wisdom in matters of this kind depends the symmetry and endurance of our industrial growth.

A committee is now at work drafting a bill, to be presented to the legislature in a few days, making it unlawful to flow mining debris into Bear river, Yuha river or Feather river, or their tributaries, and making any and all hydraulic mining companies so flowing debris in said streams answerable in proportion to the amount so thrown into said streams for the damage caused thereby; also, to ask the legislature to investigate by appropriate means this subject in order that some plan may be adopted by which the destruction occasioned by hydraulic mining on said streams may cease; and to ask the Federal government for appropriations to keep open for commerce the navigable streams of the State rendered unnavigable by hydraulic mining. This matter will bring about an exciting debate, for it is a big question to wrestle with, and a powerful pressure will be brought to bear to bring about some sort of legislation this season.

We must confess we do not see any way out of the difficulty ourselves. It is unjust to the property owners of the valley to yearly destroy their crops by the overflow; but it is also unjust to expect miners to close their cabins. The miners were there first and claim the first right. The only solution to the problem we have seen is that offered by Mr. Miller, of Nevada county, who wrote a series of communications to the Nevada Transcript on this subject, last year.

He proposes that the desired end shall be obtained by constructing reservoirs in some of the innumerable small osons and hollows among the mountains—places which are wholly useless for any purpose whatever, at present, and which would actually be utilized by the process suggested. Into these natural tanks or reservoirs the flumes and ditches should be emptied. There the waters would rapidly deposit their heavy detritus, and thence they could be reconducted to the rivers by convenient waste-weirs and sluices. In a few months the first series of reservoirs would be filled up, and the ditches could be conducted to fresh localities; but in drawing off the waters some acres of soil would be found deposited, and would afford the basis for cultivation. In this way the proceeds of hydraulic mining, instead of inflicting damages and destruction upon the valley lands, would gradually enlarge the cultivable area in the mountains, and by repairing the effects of systematic denudation by monitors and little giants, might even tend to restore the climate equilibrium at present so seriously threatened by the processes being carried on throughout the mining regions.

The Territorial Enterprise also favors the same thing, in the following, which appeared in its Saturday's issue: "There are in the foothills of California many millions of acres of land unfit for cultivation. The bed-rock is close to the surface, making the land of no use to the husbandman. The rivers should be dammed high enough in the hills to turn their streams upon these worthless lands, and reservoir succeeding reservoir should be built until the waters running from one to the other become clear enough to turn back into their original channels, or better still to be conducted to become a blessing to the land where they now are a curse. This is a great work, but its cost can be estimated, while the damage being done even now by the debris cannot be estimated. The two questions—to provide for water for the lands in the valley and to provide against the destruction because of the debris being carried down by the water—are presented together to the present California legislature. The remedy for both evils is the same. The duty is plain. The only question is how to proceed."

It is proposed to attach that portion of Dakota territory which includes the Black hills to Wyoming, thus making the 103d degree of latitude the eastern boundary line of Wyoming and providing as a natural line the eastern base of the Black hills, for the convenience of the settlers in the transaction of legal business.

The town of Munroe, in Tom Payne district, 200 miles south of Ogden, in the Sevier basin, has a mining population of 500, and yet the camp is but three months old.

In Weaverville, up to the 1st instant, twenty-seven inches of rain had fallen, besides some snow. The miners are delighted.

The mortgage tax question has not yet been decided by the Supreme Court. The case is to be argued on the 12th inst.

The Idaho Mine.

The Idaho mine, Grass Valley, has for the past seven years paid dividends regularly, and has been looked upon as one of California's prosperous mining properties. This year, although eleven dividends were paid, the yield per ton has not been so large, nor have the dividends amounted to so much. The present yield gives very little margin for profit, and the president and superintendent of the company say that any further falling off would be a reduction of dividends. During the year 1875, they crushed 28,103½ tons of rock, of which 6,828½ tons came from the 500 level; 2,096 tons from the 600 level; 10,554½ tons from the 700 level; 8,485½ tons from the 800 level; and 139½ tons from the shaft and 900 level.

This gives a total yield of 27,318 68-100 ozs. million.

147 tons sulphur..... \$478,073.36
Tailings..... 8,936.44
Specimens..... 7,946.98
Old copper plate..... 112.60
Total..... \$496,669.38

Yield per ton..... \$17.63

The report of the secretary of the company, Geo. W. Hill, as published in the *Boothill Tidings*, gives, with regard to the dividends of the mine, some interesting figures. The receipts from all sources for the fiscal year ending December 6th, 1875, \$492,925.28, which added to balance on hand show assets for the year to have been \$509,430.72. The total expenses including dividends for the year, were \$505,194.66. The dividends were eleven in number, and amounted to 55½ per cent. on the capital stock, or \$172,052. There was no dividend in November, and but \$3 per share instead of \$5 in December. The failure to declare a dividend on both of these occasions is attributed to the suspension of the former treasurer, Mr. Thos. Findley. The Secretary presents in an epitomized form the aggregate receipts and expenditures of the company for the last seven fiscal years, that being the period in which the mine has paid dividends, and before which only prospecting was done.

1869..... \$ 306,088 76
1870..... 183,450 23
1871..... 407,801 16
1872..... 404,035 52
1873..... 1,010,612 20
1874..... 669,023 03
1875..... 492,919 27

Total receipts for seven years..... \$3,473,380 16
There has been paid out in dividends as follows:

1869, 11 dividends, aggregating 55 pr. ct., \$ 170,500 00
1870, 7 " " " 12 " " 37,200 00
1871, 7 " " " 76 " " 232,600 00
1872, 11 " " " 52½ " " 162,750 00
1873, 12 " " " 220 " " 632,000 00
1874, 12 " " " 102½ " " 317,750 00
1875, 11 " " " 55½ " " 172,050 00

Being 76 dividends, aggregating 672½ per cent. on the capital stock, amounts to..... \$1,774,750 00

The president and superintendent of the mine, Edward Coleman, gives a detailed report of operations in the mine, from which we condense what is of general interest. A fire-proof building has been erected over the pump-shaft and machinery.

In regard to the underground work, the drifts have been kept well ahead of the stopes, and the mine may be considered in good working order throughout.

The 500 east hacks are worked through the 400 level a distance of 144 feet from the shaft, and there still remain about 300 feet in bottom of the 400 level to work out. The 500 east level is in 371 feet from the shaft, and there still remain about 225 feet to go before exhausting the pay chute. The 600 east hacks are about all worked out and a few months more, with a small party of men, will entirely exhaust them. The 600 west hacks are also entirely exhausted. The 600 east level is in 1,344 feet from the shaft, the last 555 of which have been either through worthless quartz or barren ground. As this drift is in further from the shaft than any other and there is still a distance of 1,257 feet to the eastern boundary, it is thought best to continue this drift on as fast as possible, with the view of prospecting that part of the claim. The 700 west hacks are all worked out, with the exception of a small piece next to the western boundary. The 700 east level is in 712 feet from the shaft, and is still in pay rock; and the hacks are worked through to the 600 level 375 feet from the shaft, and there are still remaining about 394 feet to work out in the bottom of the 600 before exhausting the pay chute. The 800 west level is in 356 feet from the shaft, the last 150 feet of which have been in rather a small ledge and low grade ore, and the hacks are worked through to the 700 level 35 feet from the shaft. The 800 east level is in 388 feet from the shaft. The ledge is quite large the full length, and the backs, also, are in a good sized ledge. It is not worked through to the 700 level at any point.

The ledge in the shaft is of good quality and well defined from the 800 down to about 60 feet below that level; the hanging wall then goes down very flat, and the ledge becomes broken up and makes into several stringers. The shaft was continued down on the same angle as before, 51½ degrees, and after sinking 120 feet from the 800 level a cross-cut was run in, and after drifting 59 feet the hanging wall was struck, but no quartz was discovered. A drift was then run east on one of the stringers; it is now in 137 feet from the shaft, with a good sized ledge in the last 10 feet; but it is not next to the hanging wall, and the quartz is of a low

grade, although showing some gold; and we have good reason to hope it will improve as it is continued east.

In looking over this statement, it will be observed we have a large amount of quartz in sight (but not broken), and as the 700, 800 and 900 levels are still in pay rock, it is impossible to give an opinion as to the amount of pay rock we may expect to take from the mine—but I have no doubt it will last for several years.

The mill and mining expenses were as follows, for the year:

Surface labor..... \$ 45,345 63
Underground labor..... 144,186 89
Wood and poles..... 24,829 60
Hardware..... 4,646 16
Drill steel..... 1,787 90
Powder and fuse..... 4,664 05
Candles and oil..... 4,503 76
Lumber..... 2,146 08
Foundry..... 8,023 89
Coal..... 1,969 01
Quicksilver..... 1,932 87
Superintendent's salary..... 6,000 00
Sundries..... 3,027 82

Total..... \$264,863 66

Average cost per ton..... \$9 06½
Other general expenses bring the total expense for the year up to \$300,647.98. There is yet the sum of \$32,490.68 due the company from Thomas Findley, its former treasurer.

Is the Fryer Process a Success?

A correspondent of ours who is traveling through the mining districts says the above question is the most frequently asked among the quartz miners, and very much interest is manifested in it. He writes as follows:

So far the public, as such, have not been permitted to see the workings of the new process; but yet those most anxious for improved milling success, say they believe certain results are evident, and that they are accomplished without battery, pans or any smelting process. For example, the heavy sulphuret ore is delivered to Mr. Fryer in massive blocks, as blasted from the mines, and in a few hours he is able to give a very high per cent. of the assay value in silver and gold in good, pure condition, and show the ore tailings pulverized far finer than by any known mechanical process now used.

Some shrewd ones try to show some possible motives for fraud in the matter; those having the most favorable means of judging, see no common sense, or common experience in that supposition, for Mr. Fryer's methods and dealings have not been of the character of a "fraud."

Grass Valley and Nevada say to the suggestion, "if he is a fraud, we could stand any amount of the same kind, for it pays its own way." One very reflective mind suggests "that if it was real it would come out quick and he done with it." But those who have noticed the many disadvantages under which Mr. Fryer labored on entering on this problem here as a stranger less than one year ago, are well satisfied that he has already done more than all the experimenters and scientists in this department have done for the last twenty years. They say for a young man and entirely unused to our processes and methods he has surely accomplished much in short time. The patents and preliminary experiments will soon be perfected, so that the public may have the opportunity to judge more satisfactorily as to its ultimate success. But the present verdict of those best posted as to what it is doing is that it is a success.

Product of the New Almaden Mine.

Through the courtesy of Mr. J. B. Randol, general manager, we are enabled to give the production of the New Almaden mine for the year 1875, in flasks of seventy-six and a half pounds each:

Months.	Flasks.
January.....	850
February.....	800
March.....	1,033
April.....	850
May.....	1,036
June.....	1,050
July.....	1,220
August.....	1,100
September.....	1,200
October.....	1,250
November.....	1,700
December.....	1,600

Total..... 13,648

The total product of the mine for 1874 was 9,084 flasks, making the increase this year 4,564 flasks, or nearly fifty per cent. Those who supposed, from the low production of last year, that the New Almaden had nearly given out, will be surprised to learn of the great increase in production this year.

The mine still holds its well earned reputation of being the most productive quicksilver mine in California, and, consequently, in the United States. For several years the percentage of ore worked was something marvelous. The first year the mine was worked the ore yielded 36.74 per cent. In 1874 the percentage was 2.96, and the yield the smallest experienced at the mine. The total product of the mine from July, 1850, to December, 1875, has been 612,173 flasks of quicksilver, of seventy-six and a half pounds each. At the mine many improvements in the reduction of ore, etc., have been made by the manager, J. B. Randol and the foreman, Mr. Fiedeler. As soon as it can be prepared we shall publish a table, showing the production of quicksilver at New Almaden from July, 1850, with all the details of yield of classes of ore, etc.

Academy of Sciences.

The annual meeting of the California Academy of Sciences was held on Monday evening last, Vice President Edwards in the chair. W. E. Burleigh and Mr. Louis Nonsbunmer were elected resident members. Dr. Henry Gibbons, Sr., was elected an honorary life member for long and distinguished services to the Academy. The principal business of the evening was the reading of the annual reports of officers, from which it appears that the institution is in a very flourishing condition.

The chairman observed that as the President of the Academy, Mr. Davidson, is still absent and will not return until a few weeks more have passed, the duty devolved on him of delivering the annual address. This year which has just closed had been indeed for the Academy a most eventful one—one from which it seemed to him that the Academy would take its new life, and which would mark its strongest and most vigorous advancement. The Academy is poor no longer. By the great benevolence of one man, Mr. Lick, the financial burdens of the society have been removed, and the organization could confidently look forward in the future to basking in the sunshines of prosperity. The property on Market street is now wholly in the hands of the Academy, the restriction in the former deed having been entirely removed. The rents give an income of \$3,800 at the present time, and the rapid progress of San Francisco will in a few years considerably enhance that sum. The number of members added to the list is twenty-seven, of whom two are life members. Some have resigned, and three have been lost by death. There are now 500 members, including seventy-eight life members. Many of the members are in arrears in the matter of dues, and to cure this, as well as to promote activity in the interests of the Academy, Mr. Edwards recommended that the names of all drones should be dropped from the list. The condition of the Academy on the whole is satisfactory. He was able to speak of a high scientific progress by the Academy. Dr. Kellogg, having an important commission to execute in connection with the Centennial, has been absent most of the year, and his place has been taken with great efficiency by W. G. W. Harford. The collection of fishes has been classified by W. R. Lockwood; the minerals arranged and labelled by C. D. Gibbs; the osteological collection and the Academy's valuable series of crania arranged by Dr. Stont; and Mr. Gruber has classified the collection of birds and promised to make such additions as will complete the series belonging to California. The donations to the museum during the year have been numerous and valuable. The museum now contains a number of duplicates, and to these the Academy should give its attention, in order that by exchanging for others not in the collection of natural history, the museum may be made more complete. For instance, the duplicates in the crustacea might be exchanged for specimens found on the Atlantic seaboard and in Europe. For the proper display of the natural history specimens, more cases are needed. The library has increased considerably in the number of volumes, and it has been enriched by a most exquisite series on entomology, profusely and beautifully illustrated. The library will soon be completely catalogued. Reference was made to the principal papers read during the year. Through the public spirit of a few generous men the botany of California will receive ample attention in a work soon to be published. The gentlemen who have given their aid in this commendable undertaking are Leland Stanford, J. C. Flood, Lloyd Tevis, R. B. Woodward, H. Pierce, D. O. Mills, John O. Earl, Wm. Norrie and H. McLaughlin. On the subject of continuing the geological survey, Mr. Edwards, while he hoped the work would be resumed, remarked that the money being given for a special purpose, it is only fair that the givers should have something to say about the carrying out of the survey, and in future some conditions as to results might accompany the grants. In carrying forward the scientific objects of the Academy, he suggested that, as in Europe, some plan should be devised of sectionizing the members according to their proclivities—some devoting themselves to geology, others to botany, others to entomology, etc., and that each section, meeting weekly, should pass on papers, and if approved have them presented at the fortnightly meetings of the Academy. The remainder of the address was prolific in suggestions on the policy which will lead the Academy on to higher scientific eminence. On the conclusion of the address Mr. Edwards was loudly applauded.

Mr. Yale, Secretary of the Board of Trustees, read the report of that body, showing the financial condition of the affairs, of which the following is a summary: Amount in Bank of California, February 20th, at the time the Board of Trustees of 1875 took charge of disbursements, \$2,900; endry deposits to date, \$1,769.78; re-transferred from the Bank of London and San Francisco to the Bank of California, \$1,293; expenditures for museum, \$558.55; salary and commissions, Curator of museum, Secretary Board of Trustees and Treasurer, \$1,021.15; rent, \$1,650; expense account, including fuel, cleaning, etc., \$142.40; advertising, \$32.80; printing, including proceedings, blanks, checks, vouchers, abstracts, receipts, postal cards, labels, etc., for museum, \$679.89; stationery and binding, \$89; freight

\$6.70; water, \$6; repairs to building, gas fixtures, etc., \$132.92. Total expenditures, \$4,369.05; balance in bank, December 31st, 1875, \$1,593.73.

The reports of the Secretary (Mr. Yale), Librarian (Mr. Fisher), and Director of museum (Dr. Kellogg), were then read. The Secretary's report stated that the average attendance at meetings during the year was 31; new members received, 27; total number of resident members, 371; and of life members, 78. There had been some 49 papers read by members during the year.

Mr. Fisher reported the library in good condition. It had all been re-arranged, catalogued according to sciences and put in good order for reference.

Dr. Kellogg reported that a great improvement was manifest in the museum, through the exertion of W. N. Lockington, C. D. Gibbs, W. G. W. Harford, Dr. Stout and F. Gruber; it had all been re-arranged, specimens identified and labeled, new alcohol added, and the whole generally overhauled and put in order. A formal vote of thanks was made to these gentlemen

Golden-Winged Wood-Pecker.

Our illustration this week shows the golden-winged wood-pecker. It is an inhabitant of all parts of the United States and of Canada. At all times animated and happy, these birds are peculiarly so at the love-making season of early spring, when their voices may be heard in the utterance of joyous sounds, and when the coy female is pursued by several males until she has indicated her preference, which produces no strife, as the rejected at once fly off elsewhere to woo. The song of the male, at this season, is not unlike a jovial laugh, nor by any means unmusical. As soon as mated, each pair immediately proceeds to excavate the trunk of a tree, and fashion a place for themselves and their young. The hole is at first made horizontal, and then downward about six or eight inches. They caress each other on the branches, climb about and around the tree with apparent delight, rattle with their bills against the tops of the dead hrnsches, chase away the



GOLDEN-WINGED WOODPECKER.

in recommendation of the Board of Trustees. A resolution of thanks was also passed to Gen. D. D. Colton, for his generous gift of books of reference in entomology. The chairman was requested to appoint a committee of five to give effect to his suggestions of sectionizing the Academy.

The annual election, which was held during the day, was quite an exciting one. There were two tickets in the field, Regular and Independent. The Regular ticket won the day with one exception, that of Henry C. Hyde, second vice-president, who was elected from the Independent ticket. The following were declared duly elected officers for the ensuing year.

President, George Davidson; first vice-president, Henry Edwards; second vice-president, Henry C. Hyde; corresponding secretary, Theodore A. Blake; recording secretary, Charles G. Yale (of the MINING AND SCIENTIFIC PRESS); treasurer, Edward F. Hall, Jr.; librarian, Wm. J. Fisher; director of museum, W. G. W. Harford; trustees, D. D. Colton, J. F. Miller, Thomas P. Madden, R. E. C. Stearns, Wm. Ashburner, George E. Gray and Ralph C. Harrison.

A VEIN of gulens twenty-seven feet thick has recently been struck in the Yosemite mine, Bingham canon, Utah.

red-heads, and feed abundantly upon ants, beetle and larvae. Before two weeks have passed, from four to six semi-transparent eggs are laid. Two broods are thus produced in each season.

This species is scarcely less happy when domesticated in confinement than when enjoying the utmost freedom, feeding well, and finding amusement in everything, but especially in the destruction of wooden furniture, for which it has great capabilities.

The flight of this bird is strong and prolonged, being performed in a straighter manner than that of any other wood-pecker, though it propels itself by numerous beats of the wings, with short intervals of sailing in an almost horizontal direction. The migrations, which are but partial, are performed in the night, and are only known by the note it utters and the whistlings of its wings. The movements of one of them upon the side of a tree, or upon the ground, are very quick, though it only alights upon the earth to pick up a beetle, caterpillar, or other insect, or perhaps a grain of corn. Apples, cherries, grapes, peiraimons, raspberries, dogwood berries, and even whortleberries and poke-berries afford it food at certain seasons; but the farmer's grain is often its feed despite of traps and scarecrows, though the farmer often makes his meal of it.

Mr. Audubon says: "The young of this species frequently have the whole upper part of the head tinged with red, which, at the approach of winter, disappears, when merely a circular line of that color is to be observed on the hind part, becoming of a rich vermilion tint. The hairy, downy and red-cockaded wood-peckers are subject to the same extraordinary changes, which, as far as I know, never reappear at any future period of their lives." This happens to both sexes. He further says: "This occurrence is the more worthy of notice, as it is exhibited on all species of the genus."

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of mention:

SEED SOWER AND CULTIVATOR.—Chas. F. Keller, Haldsburg, Cal. This invention is an improvement in cultivators and seed sowers, and consists in a novel method of making the cultivator adjustable, so as to be used simply as a cultivator, or so that it will form the drills and cover the seed when used with the seed sowing mechanism. It also consists in a novel mechanism for dropping the seed, by the use of which the inventor is enabled to regulate the spaces minutely and sow or plant at any distance apart.

SPITTOON MAT AND CARPET PROTECTOR.—John Lse, S. F., Cal. This is a mat for spittoons, so constructed that it will catch and retain anything that misses the spittoon, and prevent it from running upon the carpet. The mats are made circular, of metal, paper mache, or other suitable material. The mat is made larger than the spittoon, leaving a wide margin around it. This margin or rim is stamped or otherwise formed into cells or depressions, so that any spittle that misses the spittoon will be caught in the marginal cavities, and be prevented from running off on the carpet or floor. The rim of the mat is ornamented in any desired manner to correspond with the carpet upon which it is placed. The mat can be removed and cleansed when desired.

ROTARY PRESSURE BLOWER.—W. L. Palmer and I. W. Knox, S. F., Cal. This invention relates to certain improvements in pressure blowers, and it consists in constructing the arms of the two pistons upon certain peculiar curves, by which a close fit between the circumferences of the two drivers is maintained, and thus utilize the machine upon blast furnaces and in other places where positive force is necessary to produce a sufficient blast. In the construction of so called pressure blowers, as heretofore made, the arcs of circles have been used to form the shapes of the drivers or pistons, and by varying the length of the chords, while the same arcs are used for the sides and ends, an attempt has been made to obtain a perfect fit between the two pistons at all points of their revolution. This has not been effected, however, and as a consequence this class of blowers have been failure whenever there has been any back pressure developed. In order to overcome these difficulties, these inventors construct the heads and sides of their pistons upon epicycloidal curves in the manner patented. They say it is found that when a blower of this construction is set up, every point of the periphery of the two pistons will exactly meet as they rotate and the fit will be so perfect that the machine becomes a pressure blower, capable of working against a resistance without stop or waste.

PRINTING PHOTOGRAPHS.—Benjamin Swesey, S. F. This is an improvement in printing photographs and the ornamental background which it may be desired to introduce into any scene or picture, so that photographic prints may be obtained with scenic or artistic accessories, from plain negatives without the necessity of double printing. In the ordinary method of double printing photographic pictures, it has been customary to print a picture and carefully cut out an outline of the figure. The remainder of the picture or plain background is then secured upon the negative so that any number of figures, alone, can be printed, the background being stopped out. The figure is then in turn carefully secured upon the negative of the ornamental background which it is intended to use, so as to stop out or cover the figure which is already printed upon the sensitive paper, and thus the figure and any desired background are printed by two operations. It has been discovered that on the ordinary printing of a negative figure upon sensitive paper without stopping out the original background, an ornamental background having the figure stopped out and properly obscured or shaded can be printed upon the plain background already printed. This process has been patented, but it also takes two operations for printing. Mr. Swesey's improvement consists in making the background negative in such a manner that he is enabled to print both picture and ornamental background in one operation, and it consists in the use of a negative background upon any transparent or translucent substance, as gelatin, collodion or paper, either photographed or produced from steel or copper plates, lithographs or wood cuts by the use of printers' ink, so that this background negative can be placed upon the original negative, and the two can thus be placed on the printing frame and be printed at one operation.

SAVE YOUR HORSE'S FEET!

NO MORE RASPING AND HAMMERING TO CLINCH HORSE-SHOE NAILS. TENDER FOOTED HORSES SHOD WITH EASE. EVERY TEAMSTER HIS OWN BLACKSMITH.

The new patent implement used is an attachment to an ordinary pair of pincers. A scoop-shaped graver, or chisel, and a flattened, roughened plate, (formed in one piece) are hinged and fastened on to the handle of the pincers. When the pincers are closed the graver projects from one side of the handle, and is retained in that position by allowing the end of the plate to enter a slot between another plate on the other handle, and the handle, thus holding the graver steadily, while the pincers are grasped by both hands, and the grooves cut in the hoof below the point where the nails come through. When the grooves are cut the handles are opened, and the roughened plate turned outward, thus carrying the graver into a slot in the socket, out of the way.

To clinch the nails after the grooves are cut, the handles are opened, and the roughened plate is put beneath the hoof. The edge of a steel plate on the handle of the pincers is then placed above the nail point, and by closing the handles the nail will be bent down into the groove already cut, where it lies nearly flush with the hoof. The plate can be adjusted for large or small hoofs. The groove cut by the graver is about one-eighth of an inch long and one-eighth of an inch wide. No hammering or rasping is necessary. The foot is not bruised or scarred. Any one can learn to use it in a few minutes. Tender-footed horses can be shod with no pain to them. Further information given, if desired, by CARLES R. DONNER, Inventor, or C. F. SUHL, Cor. Commercial & Drumm Sts., S. F. eowbp

Averill Chemical Paint,

MANUFACTURED BY THE

Cal. Chemical Paint Co.

PURE WHITE, AND ANY SHADE OR COLOR.

This Paint is prepared in liquid form, READY FOR APPLICATION—requiring no thinner or dryer, and will not spoil by standing any length of time. It is Cheaper, more durable, more Elastic, and produces a more Beautiful Finish than the best of any other Paint.

It will not Fade, Chalk, Crack, or Peel off, and will last twice as long as any other Paint.

In ordering White, state whether for Outside or Inside use, as we manufacture an Inside White (Flat) for inside use, which will not turn yellow, and produces a finish superior to any other White known.

Put up in 4, 1/2, 1, 2 and 5 gallon packages, and in Barrels. Sold by the Gallon.

For further information send for Sample Card and Price List, or apply to the office.

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FACTORY: SAN FRANCISCO, CAL.

AMMONIA!

For Washing and Cleaning Purposes.

For Sale by all Grocers.

This article is universally used in Europe, and, recently introduced for general family use in San Francisco neighborhood, is already in great demand. It is now the intention of the manufacturers to introduce it all over the Pacific Coast, at prices which will bring it within the reach of every household.

It is unequalled for cleansing Woolen Fabrics, Cutlery, Carpets or Crockery; for Scrubbing Floors, Washing Paint, Removing Grease Spots, Shampooing or Bathing. It renders water soft, and imparts a delightful sense of coolness after washing.

DIRECTIONS.—For Laundry, use two to four tablespoonfuls to a washful of water. For bathing, use one tablespoonful in the bath tub. For removing grease spots, apply with a brush, undiluted, and wash with water afterwards. For stimulating the growth of plants, use a few drops in every pint of water used in watering.

PRICE.—Per Pint Bottle, 25 cents; per quart Quart Bottle, 40 cents; per Half Gallon, 75 cents.

Also, SULPHATE OF AMMONIA for chemical purposes, fertilizing and the preparation of artificial manures. AMMONIACAL PREPARATION, for the prevention and removal of boiler scale. CRUDE AMMONIA, for general manufacturing and PURE LIQUOR and AQUA AMMONIA for chemical and pharmaceutical purposes.

Manufactured by the
SAN FRANCISCO GAS-LIGHT CO.
eowbp

VIRGINIA CITY SUFFERERS' RELIEF FUND.

NOTICE.—All persons who wish to contribute money to the assistance of the sufferers by the late fire in Virginia City, will please make out their checks in the name of GEO. S. DODGE, Treasurer, and leave the same at Rooms 12 or 17, Hayward's Building, California street. Those sending cash will please forward to the same name and destination.

Several solicitors have been appointed, who are provided with pass-books signed by the President, Treasurer and Secretary. The Secretary will be daily in attendance from 9 A. M. to 3 P. M.

HON. J. P. JONES, President.
GEO. S. DODGE, Treasurer.
RICHARD WHEELER, Secretary.

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Removed to 32 Fremont Street, near Market.



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Manufacturer of perforated sheet metals of every description, at reduced rates. Will own using Battery Screens extensively, can contract for large supplies at favorable rates. This is the only establishment on the Coast devoted exclusively to the manufacture of Screens

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Manufacturers of

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OIL Cakes and MEAL.

Highest price paid for Flax Seed and Castor Beans de-livered at our works.
Office, 3 and 5 Front street.
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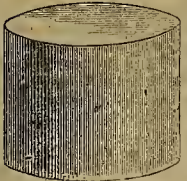
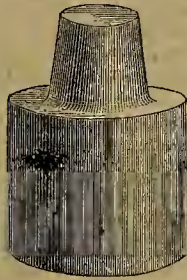
Improved Cast and Forged Steel Shoes and Dies for Quartz Mills.

[PATENTED MAY 26TH, 1874.]

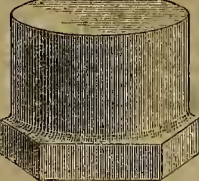
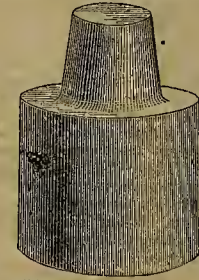
Price Reduced to 16 Cents Per Pound.

SAN FRANCISCO, November 10th, 1874.

To Suprs. of Quartz Mills and Mining Men generally.



We take pleasure in stating that owing to the rapid increase in our orders, our Pittsburg Manufacturers have been compelled to add largely to their works—a new gas furnace and heavier trip hammer—and are thus enabled to reduce the cost of steel and at the same time produce SHOES and DIES superior to any yet manufactured. We have consequently reduced the price to 16 cents per pound and solicit a trial order, guaranteeing that you will find them at least 10 per cent cheaper than the best iron. There are no STEEL SHOES and DIES made excepting under our patent and sold at this office, or by our authorized agents, though certain Eastern manufacturers advertise STEEL SHOES and DIES which are only cast iron hardened by the addition of a composition. They will not outwear two sets of common iron, though called steel. They are very brittle and are not capable of being tempered, flying from under the hammer like cast iron. Our STEEL SHOES and DIES are in use in many of the largest mills on the Pacific Coast, and all who have tried them pronounce them cheaper and far superior to iron in every respect, even at the old price of 20 cents per pound. Their advantages over iron are cheapness on first cost, increased crushing capacity, time saved in changing and in setting tappets, increased value of amalgam by absence of iron dust and chippings, and a saving of 75 per cent. in freight. It takes 60 days to fill orders from the manufactory East. Price 16 cents per pound shipped at San Francisco. Terms liberal.



Address all orders, with dimensions, to W. R. Townsend, Secretary.
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In the Country,

Comprising all those

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SPECIAL DRILLS. For special work. Gun Blank Drills, Coal Drills, &c., built to order.

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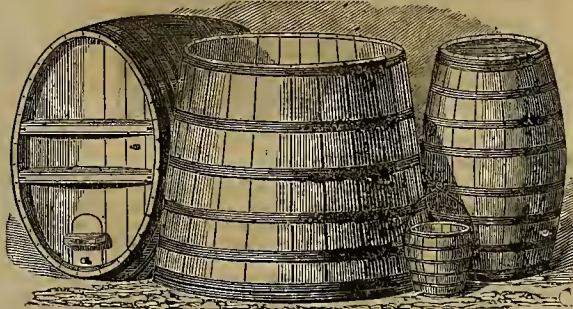
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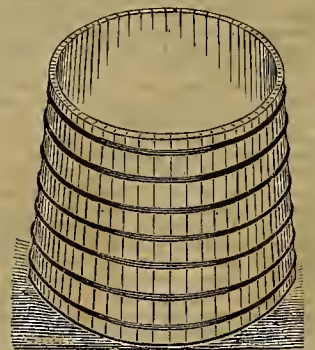
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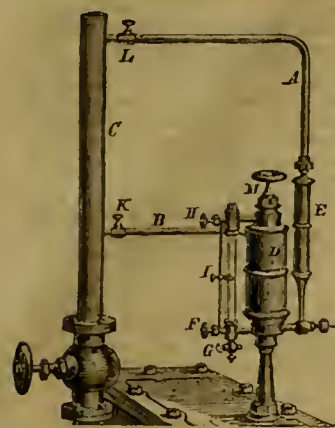
The undersigned, owners of LESCHOT'S PATENT for DIAMOND POINTED DRILLS, now brought to the highest state of perfection, are prepared to fill orders for the IMPROVED PROSPECTING and TUNNELING DRILLS, with or without power, at short notice, and at reduced prices. Abundant testimony furnished of the great economy and successful working of numerous machines in operation in the quartz and gravel mines on this coast. Circulars forwarded, and full information given upon application.

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Awarded by the Mechanics' Institute Fair, San Francisco, and State Fair, Sacramento, 1871.

These Lubricators are acknowledged by all engineers to be superior to any they have ever used; feed constantly by pressure of condensed water, supplied by pipe A, regulated under the oil by valve J, and forced out through check valve and pipe B into the steam pipe C; it then becomes greasy steam, passes to all the valves and cylinder at every stroke of the engine; glass tube I indicates amount used per hour. Packing on rods and stems lasts longer, and the rings on the piston will not corrode. One pint of oil will last from three to six days, according to speed and size of engine; I, sliding gauge; K, valve to shut off when engine stops; H, F, valves to shut off in case of frost; steam does not enter the cup; it is always cool; warranted to give satisfaction. Patented February 14, 1871. Made by California Brass Works, 125 First street, S. F. 24v23

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Double Treadle, inclining one doz. Saws, thirty immitable Feet Sawing Patterns and Prepared Wood to the value of \$4. A new device for tightening Saw, Power Drilling attachment, Wrench, Oil Cup and Driver. Speed, 800 strokes per minute. Saws 1 1/2 in. thick. Price, complete, case and delivered on board cars or at Express office, \$12

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Will wear three times longer than any iron Shoes.

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SEWING MACHINES.

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HOME and HOME SHUTTLE SEWING MACHINES.

Reduced to Live and Let Live Prices.

These Machines are superior to any and all; nice sewers, straight needle, two threads, shuttle, lock-stitch, the simplest and cheapest, and the lightest running first-class Machines in the market. To see is to convince yourselves.

The Hall Treadle for Sewing Machines.

The most important improvement ever made. It saves labor and preserves health. No more diseases and deaths, side or back aches from using Sewing Machines. No teaching required. A child can run it. Always starts the right way. Never goes backwards and breaks things. Can be stopped instantly. With it on your Machine, you can do double the work you can without it. Fifty stitches can be made with one pressure of one foot. It can be applied to any Sewing Machine. Approved by Massachusetts State Board of Health (see Official Report 1872), Massachusetts Medical Society and Massachusetts Charitable Mechanics' Association. The HALL TREADLE is a part of all HOME MACHINES sold by us.

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Must be seen to be appreciated. For a Farmer or Mechanic to see it, is to buy one. It is an indispensable article in every Farm-house, Shop or Hotel.

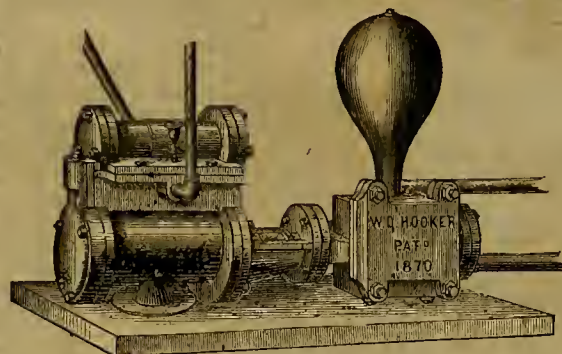
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N. B.—Also manufacturer of Hooker's Deep Well and Double-Acting Force Pump. Received the Silver Medal awarded at the last Mechanics' Fair in San Francisco.

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SIMPLE, CHEAP AND DURABLE.

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LIGHT VERTICAL BURR MILLS

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MITCHELL'S

New York Candles

Full Weight and 14 ounce.

Will be found on comparison to be

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14 GMG. OZ.

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FOR SALE BY ALL THE LEADING JOBBERS.

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Manufacturers of ENGINE LATHES, 48 inches swing and smaller; VERTICAL BORING MACHINES, suitable for jobbing and boring Car Wheels; UPRIGHT DRILLS, 36 inches and smaller, and other Machinists' Tools.

COR. NORTH FIFTEENTH ST.

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The Ingersoll Rock-Drill

IS EXTENSIVELY USED IN THE EAST

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Because it can be run with less power, labor and repairs, and do more work than any other Drill in the market. It has but few parts, is easily handled, being light, and has

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RICHARD C. HANSON & CO.

BLOCK & PUMP MAKERS,

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STEEL FRICTION ROLLERS.

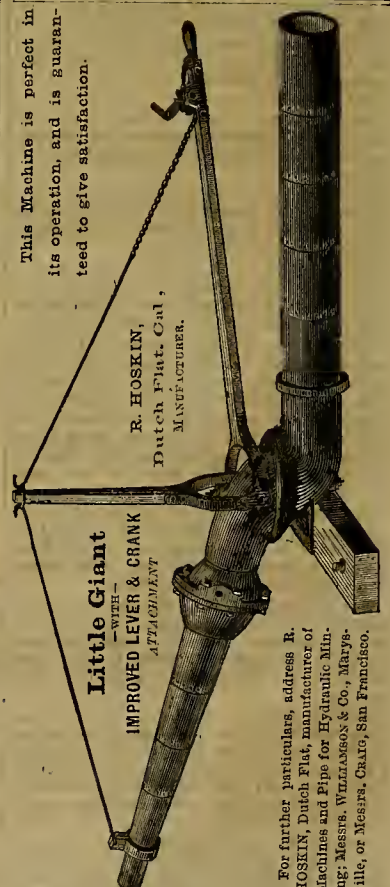
MINING BLOCKS OF ALL DESCRIPTIONS,

PRESSED LEATHER FOR PUMPS,

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Near Market, - - - - - in 5-2am - - - - - SAN FRANCISCO.



This Machine is perfect in its operation, and is guaranteed to give satisfaction.

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Little Giant - WITH - IMPROVED LEVER & CRANK ATTACHMENT

For further particulars, address R. HOSKIN, Dutch Flat, manufacturer of Machines and Pipe for Hydraulic Mining; Messte, Williamson & Co., Marysville, or Messrs. CRAIG, San Francisco.

CHAS. H. PHELPS,

ATTORNEY AT LAW,

308 PINE ST., N. W. Cor. Sansome, SAN FRANCISCO

Special attention given to cases involving Mining, Patent or Commercial Law.

General News Items.

SIR ANTHONY ROTHSCHILD is dead.

BOWEN'S libel suit has been discontinued.

THE Ecumenical council is to re-assemble.

EX-QUEEN ISABELLA of Spain is very seriously ill.

THE Bremen dynamite horror is to be investigated.

THERE are 1,093 State prisoners at San Quentin.

GEN. GRANT and Briatow are to be witnesses in the Bahcock trial.

It is now thought that Congress will grant \$1,000,000 in aid of the Centennial.

THE San Francisco clearing house is expected to open on the first of March.

ANOTHER fair bride in this city has renounced Christianity and married an Israelite.

NEW YORK having lost Tweed, is now about to show up the canal frauds for a sensation.

THE Spanish Government declares that it will satisfy all just complaints of the Cubans.

THE prospect is fair for a speedy completion of the Chico and Colusa narrow gauge railroad.

A FULL statement of affairs is shortly expected from the National Gold Bank and Trust company.

EARTHQUAKES have been stirring up the people in the Eastern States and giving them a new sensation.

AN exhibition of specimens of needlework done in the public schools of London by the girls, has lately been held in that city.

JOHN LANDERS was fatally injured while "thawing" out a giant powder cartridge at Silver City on New Year's Eve.

THE Relief Committee is about to cease business, and turn over the supplies on hand to the Virginia City benevolent society.

PAYMASTER SPAULDING has been placed under arrest on board the Independence, at Mare island, by orders of Secretary Robeson.

A LIVERPOOL company is negotiating with the Marquis of Bute for the establishment of a steamship line between Cardiff and New York.

JAMES ANTHONY, late one of the proprietors of the Sacramento Union, died of apoplexy in this city on Monday last.

DELMONICO, of New York, is to have the main restaurant at the Centennial. It will be magnificently fitted up.

THE mortgage tax question has not yet been decided by the Supreme Court. The case is to be argued on the 12th inst.

THE annual meeting of the Nevada State agricultural, mining and mechanical society will be held at Reno on Monday, January 17th.

A FEW days ago a miner in the Crown Point shaft picked up the wrong dinner bucket, and on arriving at home found \$1,100 in it. The distracted owner soon claimed the cash.

A TERRITORIAL wagon road is about to be built from Cheyenne to the Black Hills. The Legislature of Wyoming recently passed an act for its location.

THE Senate has refused to confirm the appointment of Major General Jas. Coey as commander of this division of the national guard of California.

THE Russians are beginning to turn their attention to the advantage of connecting St. Petersburg with China by means of a telegraph across Siberia.

THE narrow gauge railroad at Lake Tahoe, leading from the saw mills of Yerington, Bliss & Co. to the wood flumes, is snowed up for the winter. Operations will cease for the season.

According to the local journal, gold, silver, coal, and other valuable deposits abound in Humboldt county in sufficient quantities to make the defunct '49er rise from his ashes.

THE railroad company is collecting rails and material at Woodland to furnish the Tehama road when the grading is completed. There is now about forty or fifty miles of the track graded.

THE Steamship City of Peking, which left this port on Tuesday for China, returned on Wednesday, having cracked one of the blow valves after being out one day. The Peking seems to be singularly unfortunate.

THE Secretary of War officially announces that 871-1000 of the weather predictions of the Signal Service Bureau of last year have been fully and accurately verified. The accuracy of the predictions is increasing from year to year.

WILLOW CREEK, a Humboldt county mining camp, is noted for its dispensation of justice. Recently a Chinaman was detected in robbing a sluice box. A court of miners was immediately convened and the Mongolian sentenced to receive thirty lashes, after which he was told to leave the diggings.

DURING the past year the San Francisco mail carriers performed the following work: Mail letters delivered, 2,927,197; city letters delivered, 1,016,256; postal cards delivered, 738,225; newspapers delivered, 1,155,821; registered letters delivered, 10,697; letters collected, 5,043,178; postal cards collected, 569,556; newspapers collected, 814,698.

WOODWARD'S GARDENS embraces an Aquarium, Menagerie, Art Gallery, Conservatories, Tropical Houses, Menagerie, Seal Ponds and Skating Rink.

PATENTS & INVENTIONS.

A Weekly List of U. S. Patents Issued to Pacific Coast Inventors.

FROM OFFICIAL REPORTS FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.]

By Special Dispatch, Dated Washington, D. C., Jan 4th, 1876.

FOR WEEK ENDING DECEMBER 21st, 1875.*
SPITTOON MAT.—John Lee, S. F., Cal.
MASH ATTEMPERATOR.—William Paddon, S. F., Cal.

APPARATUS FOR AGING LIQUORS.—Jean B. Baux, Oakland, Cal.

HANOINO OR PORTABLE FOUNTAINS.—Frank C. Shafer, S. F., Cal.

TRADEMARKS.

HAIR PRODUCER.—H. A. Moore, S. F. Cal.
POISON AND POISONOUS COMPOSITIONS FOR THE DESTRUCTION OF SQUIBBLES.—

*The patents are not ready for delivery by the Patent Office until some 14 days after the date of issue.
NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

New Incorporations.

The following companies have filed certificates of incorporation in the County Clerk's Office at San Francisco:

GRASSHOPPER M. Co.—January 4th. Location: Mojito Gulch, Calaveras county, California. Capital stock, \$3,000,000. Directors—F. W. Robinson, J. M. Curry, Vernon Seaman, George H. Dell and T. B. Beach.

EAST CALIFORNIA S. M. Co.—January 5th. Location: Nevada. Directors—Wm. F. Anderson, R. E. Brewster, E. Green, John Rosenfeld and M. M. Wheeler. Capital stock, \$10,000,000.

OSBERT M. Co.—January 5th. Location: Eagle valley mining district, Ormsby county, Nevada. Directors—O. Coats, S. E. Thornton, Thos. Wallace, R. B. Noyes and P. B. Moore. Capital stock, \$10,000,000.

THE assay office and bullion department of the Consolidated Virginia mine will have a capacity for assay and melting bullion to the amount of \$5,000,000 per month. Like every other part of the works, they are to be greatly improved. A condensing flue of brickwork 2½x5 ft will be run the entire length of the building, 100 feet and return, which will give a flue 200 ft in length before commencing to ascend the chimney, which will be 88 ft in height. The bottom of this flue will be sheathed with iron to assist in saving the gold and silver drawn off in the fumes from the furnace.

A TUNNEL, which W. M. Simpson is running on the West Weaver, Trinity county, caved in last week, and the neighbors somehow got the impression that the owner was reposing somewhere in the howls of the hill. After a hundred or more had been engaged half a day in throwing dirt like a lot of hangers, Simpson appeared over the slope and relieved their solicitude.

In the Justice mine ore extraction and development goes steadily ahead at the 400 and 600-ft levels, the daily yield being about 30 tons per day, which is being reduced at the Spring Valley mill.

A VERY large force of workmen are still engaged in repairing the Felton railroad. Rapid progress is being made, and the road will be ready for the transaction of business in a few days.

A GENTLEMAN who has had experience in the oil regions of Pennsylvania has recently purchased 200 acres of oil land at San Fernando, and ordered extensive machinery from the East.

It is stated that the Spring Valley mining company, at Cherokee, Butte county, have discharged their white laborers and substituted Chinamen.

THE tunnel through Town Talk hill, between Grass Valley and Nevada City, on the Colfax and Nevada narrow gauge railroad, is completed.

THE Humboldt Register says that old Humboldt City will again become a busy burg after having been deserted for years.

THE amount of bullion shipped from Palisade by Wells, Fargo & Co., the present year, is 22,424,146 pounds.

THE railroad sheds over the Sierra are in good condition, and no fear of a blockade this winter.

A GREAT deposit of copper ore has been found on Woodchuck creek, Missoula county, Montana.

THE Consolidated Virginia mine is again producing at the rate of \$1,800,000 per month.

It is suicide in the third degree, if not worse, to suffer a cough and cold to culminate in consumption, when a single bottle of HALE'S ROSEY OF HONORUM AND TAR, taken in time, would effect a perfect and permanent cure.
Pike's Toothache Drops cure in one minute.

METALS.

[WHOLESALE.]

WEDNESDAY M., January 5, 1876.

American Pig Iron, @ ton	38 00	36 00
Acotch Pig Iron, @ ton	35 00	37 00
White Pig, @ ton	—	38 00
Oregon Pig, @ ton	—	40 00
Refined Bar, good assortment, @ lb	—	3 1/2
Boiler, No. 10 to 14	—	5 1/2
Sheet, No. 5 to 8	—	5 1/2
Sheet, No. 16 to 20	—	5 1/2
Sheet, No. 22 to 24	—	5 1/2
Sheet, No. 26 to 28	—	5 1/2
Horse Shoes, per doz	6 50	8 00
Nail Rod	10	—
Norway Iron	2	—
Roller Iron	2	—
Other Irons for Blacksmiths, Miners, etc.	—	4 1/2
COPPER—		
Copper Tied, @ ton	35	—
O'Neil's Pat.	37 1/2	—
Sheathing, @ lb	24	—
Sheathing, Yellow	24	—
Sheathing, Old Yellow	24	—
Composition Nails	24	—
Composition Bolts	24	—
—Screwed Cast	20	—
Anderson & Woods' American Cast	20	—
Drill	18	—
First Bar	18	—
Flow Steel	9	—
TIN PLATE—		
10x14 1/2 O. Charcoal	10 50	11 00
10x14 1/2 X Charcoal	10 50	13 00
Rolling Plate O. Charcoal	10 50	14 00
Banco Tin	26	—
Australian	18	—
ZINC—		
By the Case	12	—
20x30, 18x24, No 10 to 12	—	11 1/2
do do 2x3 ft, No 10 to 12	—	11 1/2
do do 8x1 ft, No 8 to 10	—	11 1/2
do do 3x1 ft, No 8 to 10	—	11 1/2
NAILS Assorted sizes	3 60	3 75
WIRE SIZES, per lb	7 1/2	7 1/2

LEATHER.

[WHOLESALE.]

WEDNESDAY M., January 5, 1876.

City Tanned Leather, @ lb	22 1/2	22 1/2
Santa Cruz Leather, @ lb	22 1/2	22 1/2
Crookton Leather, @ lb	22 1/2	22 1/2
Jeckel, 14 lb, per doz	8 00	7 90
Jeckel, 11 to 13 lb, per doz	8 00	7 90
Jeckel, 14 to 16 lb, per doz	8 00	7 90
Jeckel, second cut, 11 to 13 lb, per doz	57 00	74 00
Cornellian, 12 to 16 lb, per doz	57 00	57 00
Cornellian Females, 12 to 13 lb, per doz	63 00	57 00
Simon Ulmo Females, 12 to 13 lb, per doz	58 00	57 00
Simon Ulmo Females, 14 to 15 lb, per doz	58 00	57 00
Simon Ulmo Females, 16 to 17 lb, per doz	72 00	74 00
Simon, 18 lb, per doz	61 00	63 00
Simon, 20 lb, per doz	63 00	67 00
Simon, 24 lb, per doz	72 00	74 00
Robert Aft, 7 and 9 lb, per doz	35 00	40 00
French Kips, @ lb	1 00	1 15
California Kip, @ lb	40 00	40 00
French Sheep, all colors, @ doz	9 00	15 00
Eastern Oak for Backs, @ doz	1 00	1 25
Sheep Roans for Topping, all colors, @ doz	9 00	13 00
Sheep Roans for Lining, all colors, @ doz	5 50	10 50
California Russet Sheep Linings, @ doz	1 75	4 50
Best Jeckel Calf Boot Legs, @ pair	5 00	5 25
Good French Calf Boot Legs, @ pair	4 00	4 25
French Calf Boot Legs, @ pair	4 00	4 25
Harness Leather, @ lb	24	—
Fair Bridle Leather, @ doz	48	—
Stirring Leather, @ doz	48	—
Well Leather, @ doz	30	—
Ruff Leather, @ foot	17 1/2	—
Wax Side Leather, @ foot	17 1/2	—

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by CHARLES SUTRO & Co.]

SAN FRANCISCO, January 5, 3 P. M.

LEGAL TENDERS in S. F., U. S. M., 83 1/2 to 84 1/2.
GOLD in N. Y. 112 1/2.
GOLD BARS, 83 1/2 to 84 1/2. SILVER BARS, 7 1/2 and 8 per cent. discount.
EXCHANGE on N. Y., 60-100 per cent premium for gold; on London bankers, 4 1/2; Commercial, 4 1/4; Paris, five francs per dollar; Mexican dollars, three to five per cent. discount.
LONDON—Consols, 93 to 93 1/2; Bonds, 102 1/2.
SILVER in S. F., by the disk, per lb, 72 1/2 to 73 1/2.

Something of Interest to the Old Folks, and to the Boys and Girls.

THE BOSTON JOURNAL, in a recent issue, says: "Picture to yourself what a magazine for children ought to be—how bright and winning in contents, how pure and stimulating in teaching, how resplendent with pictures, and then turn over the pages of ST. NICHOLAS, and you will find your ideal realized."

THE CHICAGO INTER-OCEAN says: "ST. NICHOLAS is an institution of which Young and Old America are as proud as England is of PUNCH. A house without ST. NICHOLAS," continues the writer, "does not deserve to own any boys and girls; no dog should wag its little tail while pressing its nose through the area railings; emphatically, we would observe that should the sun descend to shine upon that house, his solar majesty would make a big mistake."

THE FIRST VOLUME of ST. NICHOLAS was a surprise even to the public that had heartily welcomed it, number by number. Newspaper critics expressed enthusiastic approval; children and parents were alike delighted, and congratulatory letters from distinguished men and women poured in upon the publishers and editor. Charles Dudley Warner wrote: "I do not see how it can be made any better, and if children don't like it, it is time to change the kind of children in this country." Whittier, our great poet, wrote: "It is little to say of this magazine that it is the best child's periodical in the world;" and words of hearty commendation came across the ocean from such earnest workers and popular favorites of the young as Geo. MacDonald, Christina Rossetti, and Canon Kingsley.

Beautifully bound, superbly illustrated, and filled with good things from the best writers, (including three long serial stories), the first volume of ST. NICHOLAS, complete in itself, is a finer Christmas gift for girls and boys to-day than any single book in the market, excepting

St. Nicholas for 1875,

Which, with its magnificent pictures, its two complete serials, and its innumerable shorter stories, sketches, poems, fairy tales, rhymes and jingles, bits of wisdom, its French, German and Latin stories—its fun and its puzzles, Jack-in-the-pulpit, the Letter-box, etc., etc., is even more superbly attractive.

St. Nicholas for 1874 and 1875, 4 Vols.

For the convenience of libraries, and because many

children find the two large volumes for '74 and '75 rather bulky to handle, we have had these twenty-four numbers bound in four elegant volumes, and inclosed in a neat box, under the general title of

THE ST. NICHOLAS LIBRARY.

These four volumes are sold for \$3, being only two dollars a volume—a beautiful and valuable Christmas present for an entire family of young folks.

THE NEW-YORK TRIBUNE says: "In the avalanche of immoral literature that threatens the children, some strong, vitally wholesome, and really attractive magazine is required for them, and ST. NICHOLAS has reached a higher platform, and commands for this service wider resources in art and letters, than any of its predecessors or contemporaries."

THE SUNDAY SCHOOL TIMES says: "A cleaner, purer more trustworthy periodical cannot be named. The magazine does not claim to be religious, but it is on the side of all that is true and good, from beginning to end."

The religious press all over the country heartily commends ST. NICHOLAS, and virtually echoes the opinion of the NEW-YORK CHRISTIAN UNION, that it is "A DELIGHTFUL MAGAZINE FOR ALL CHILDREN BETWEEN FIVE AND EIGHTY-SEVEN."

St. Nicholas for 1876

Promises even greater attractions than the previous volumes. A strong feature of the new volume is an AMERICAN SERIAL STORY,

"The Boy Emigrants," by Noah Brooks,

Giving the adventures of a party of boys on their long journey across the plains, with a vivid portrayal of their LIFE IN CALIFORNIA DURING THE DAYS OF THE GOLD FEVER. Mr. Brooks brings to this work, in addition to his well known literary gifts, a thorough familiarity with the features of that wild country and the people then flocking toward it. What he has to say of reality that enables the reader to follow the characters in their adventures with a positive sense of companionship. The contagion of the "gold-fever," the great difficulties and perils which beleaguered their journey across the plains and mountains, and finally the adventurous, half-civilized, and yet, in a certain rude way, poetic life in the mines of California, are all described with wonderful truthfulness and skill. Add to this the elevated tone pervading the work, and the irresistible attraction which such a narrative possesses for boys, and the value of this stirring, healthy serial becomes evident.

There is to be another and shorter serial, beginning in January and running through three numbers:

"Jon of Iceland," by Bayard Taylor.

A delightfully vivid story of an Icelandic boy's career, full of incidents which could happen in no other country, and graphically touching upon the customs, life, and general features of that strange land.

The best general reading for boys and girls is insured by a list of present and promised contributors, among whom are:

WILLIAM CULLEN BRYANT, GEORGE MACDONALD, ALD, CHRISTINA ROSSETTI, LOUISA M. ALCOCK, J. T. TROWBRIDGE, T. B. ALDRICH, ELIZABETH STUART PHELPS, ABBY MORTON DIAZ, HARRIET PRESCOTT SPOFFORD, DONALD G. MITCHELL, H. K., EDMUND C. STEDMAN, LUCY LARCOM, CHAS. DUDLEY WARNER, BRET HARTE, FRANK R. STOCKTON, ELIZABETH AKERS ALLEN, T. W. HIGGINSON, LUCRETIA P. HALE, PROF. R. A. PROCTOR, MRS. OLIPHANT and REV. EDWARD EGLESTON.

Special papers are secured or promised, viz: Astronomy for Young Folks (Prof. Proctor); Chapters on Windsor Castle and English History (Mrs. Oliphant); Talks With Girls (Mrs. A. D. T. Whitney, H. H., Louisa M. Alcott, Susan Coolidge and Mrs. Dodge); Little Housekeepers' Pages (Marion Harland, author of "Common Sense in the Household"); Also, incidents of American History, Practical Handwork for Boys and Girls, Sketches of Adventure and Travel, Fairy Tales, and Stories of Home Life. A Young Contributor's department is to be added to the well known and approved Regular Features; and, in short, the Magazine will be made as useful, lively, and entertaining as the purest and best writers and artists can make it.

SOME OF THE FINEST WORKS OF THE GREAT PAINTERS have been engraved for ST. NICHOLAS, and its illustrations for 1876 will surpass anything ever yet attempted in Juvenile literature.

\$3.00 A Year; \$4 for Bound Vol.

We will send the magazine for one year, beginning November, 1875, and either of the two volumes as above, post paid, for \$7.00; or a subscription one year and the two volumes for \$10.00. The price of the 4-volume edition is \$3.00. All newsdealers and book-sellers will receive subscriptions and supply volumes at above rates.

NOVEMBER and DECEMBER numbers FREE to all new subscribers for 1876. SCRIBNER'S MONTHLY and ST. NICHOLAS, \$7.

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22v17-3mBARTLING & KIMBALL,
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505 Clay street, (southwest cor. Sansome),
SAN FRANCISCO.At a Stated Term of the Circuit Court
of the United States of America of the Ninth Judicial
Circuit in and for the District of California, held
at the court room in the city and county of San Fran-
cisco, on Thursday, the 30th day of September, in the
year of our Lord one thousand eight hundred and sev-
enty-five. Present—The Honorable Lorenzo Sawyer,
Judge.Nicholas Selbert, complainant, vs. Wm. T. Garrett,
defendant—In equity.
DECREES.
This cause came in to be heard at the February
Term, A. D. 1875, of this Court and was argued by
counsel and thereupon upon consideration thereof, it
was ordered, and adjudged, as follows, viz: That
defendant, William T. Garrett, was not the first or
original inventor, or discoverer of the improvement
or discovery claimed by him, in and by those certain
reissued letters patent of the United States, number
five thousand three hundred and twenty-eight (No.
5328), for an alleged new and useful improvement in
lubricators, issued to said defendant, William T. Gar-
rett, on the 18th day of March, A. D. 1873, and is not
entitled to a patent therefor, and that said reissued
letters patent, number five thousand three hundred
and twenty-eight (No. 5328) are declared void and the
same are hereby vacated and set aside by reason of their
interference with those certain letters patent of the
United States, number one hundred and eleven thou-
sand eight hundred and eighty-one (No. 111,881) for a
new and useful improvement in lubricators, issued to
complainant, Nicholas Selbert, on the fourteenth (14th)
day of February, A. D. 1871.It was also further ordered, adjudged and decreed
that complainant do have and recover of and from de-
fendant his costs and expenses to be taxed herein.
(Signed) LORENZO SAWYER,
Circuit Judge.The above decree has reference to "Selbert's Eureka
Lubricator" for oiling the valves and cylinders of
steam engines.It has a glass gauge and condensing pipe, or reser-
voir, with a regulating feed valve, and works as fol-
lows: As the water of condensation is admitted, under
the oil, just so fast the oil passes out at the top through
a pipe into the steam pipe to oil the valves and
cylinder.Parties who infringe or purchase the infringed
lubricators, will be held strictly responsible.
N. SELBERT, Patentee,
125 First Street, S. F.Notice to Miners, Stevedores, Well
Borers, Farmers or Others Wanting a
Portable or Stationary Steam Power.A No. 1 Hawkins & Oatwell Hoisting Engine, 6x12 cyl
inder, mounted on wheels, with brake, tongue, double
trees and neck yoke. Engine been used only three
months; good as new. For sale low. Address,

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REDUCTION WORKS.

One or Two Hundred Shares for sale cheap, for
account of whom it may concern.JOHN MCCOMBE, Money Broker,
429 Montgomery street.

Orders by mail promptly attended to.

DIVIDEND NOTICE.

San Francisco Savings Union, 532 Cal-
ifornia street, corner Webb. For the half year ending
December 31, 1875, a dividend has been declared
at the rate of nine (9) per cent. per annum on Term
Deposits and seven and one-half (7 1/2) per cent. on
Ordinary Deposits, free of Federal tax, payable on and
after January 12, 1876. By order of
LOVELL WHITE, Cashier.

DIVIDEND NOTICE.

California Savings and Loan Society,
512 California street. The Directors have declared a
dividend of nine and six-tenths (9 6/10) per cent. per
annum on Term Deposits and eight (8) per cent. on
Ordinary Deposits, for the half year ending December 31, 1875,
free from Federal tax, and payable on and after Sat-
urday, January 8, 1876. By order,
D. B. CHISHOLM, Secretary.

SUTTER CREEK, February 26th, 1875.

Messrs. DEWEY & Co.—I have received my Letters
Patent through your Agency, and, for your prompt-
ness, accept my thanks. Yours,
S. N. KNOTT.

Mining and Other Companies.

Cherokee Flat Blue Gravel Company—
Location of principal place of business, San Francisco,
Cal. Location of works, Cherokee Flat, Butte County,
Cal.Notice is hereby given, that at a meeting of the Board of
Directors, held on the twenty-eighth day of December,
1875, an assessment, No. 35, of five cents per share was levied
upon the capital stock of the corporation, payable im-
mediately in United States gold coin to the Secretary, at the
Office of the company, room 13, Safe Deposit Building,
No. 328 Montgomery street, San Francisco, Cal.
Any stock upon which said assessment shall remain un-
paid on the twenty-ninth day of January, 1876, will be de-
linquent, and advertised for sale at public auction; and
unless payment is made before, will be sold on Saturday,
the nineteenth day of February, 1876, to pay the delinquent
assessment, together with costs of advertising and ex-
penses of sale.

O. H. BOGART, Secretary.

Office, room 13, No. 328 Montgomery street, San Fran-
cisco, Cal.Owyhee Water and Gravel Mining Company.
Location of principal place of business, San Fran-
cisco, Cal. Location of mines, Elko County,
Nev.Notice.—There are delinquent upon the following
described stock, on account of assessment, (No. 1)
levied on the first day of November, 1875, the several
amounts set opposite the names of the respective share-
holders, as follows:

Name.	No. Certificate.	No. Shares.	Amount.
M. Baldwin.....	37	100	\$30 00
M. A. Baldwin.....	43	7400	2220 00
B. Lande, trustee.....	3	10000	3000 00
B. Lande, trustee.....	54	50	15 00
B. Lande, trustee.....	50	12000	3600 00
O. H. Lagrange, trustee.....	39	100	30 00
T. H. Mayne.....	21	1000	300 00
J. W. Pence, John Watson and R. B. Langdon, one undivided third each.....	36	100	30 00
J. W. Pence, John Watson and R. B. Langdon, one undivided third each.....	40	19000	5700 00
J. W. Pence, John Watson and R. B. Langdon, one undivided third each.....	42	2500	750 00
H. H. Pearson.....	44	100	30 00

And in accordance with law, and an order of the
Board of Directors made on the first day of November,
1875, so many shares of each parcel of such stock as
may be necessary, will be sold at public auction, on the
fifteenth day of January, 1876, at the hour of 2 o'clock,
P. M., of said day, to pay said delinquent assessment
thereon, together with costs of advertising and expenses
of sale.
JOHN E. McDONALD, Secretary.
Office, No. 405 California street, San Francisco, Cal.

Pauper Mining Company.—Location of
principal place of business, San Francisco, Califor-
nia. Location of works, Gwythe county, Idaho Ter-
ritory.Notice.—There are delinquent upon the following
described stock, on account of Assessment No. 6, levied
on the 9th day of November, 1875, the several amounts
set opposite the names of the respective shareholders
as follows:

Name.	No. Certificate.	No. Shares.	Amount.
W. F. Bogart, Trustee.....	2	100	\$20 00
W. F. Bogart, Trustee.....	7	150	30 00
W. F. Bogart, Trustee.....	8	100	20 00
W. F. Bogart, Trustee.....	9	100	20 00
W. F. Bogart, Trustee.....	10	100	20 00
Crocker & Gunnett, Trustees.....	11	25	5 00
Crocker & Gunnett, Trustees.....	12	25	5 00
Crocker & Gunnett, Trustees.....	13	25	5 00
G. A. Courson, Trustee.....	14	500	100 00
G. A. Courson, Trustee.....	15	500	100 00
G. A. Courson, Trustee.....	16	100	20 00
G. A. Courson, Trustee.....	17	100	20 00
G. A. Courson, Trustee.....	18	100	20 00
G. A. Courson, Trustee.....	19	100	20 00
G. A. Courson, Trustee.....	20	100	20 00
C. P. Gordon, Trustee.....	35	100	20 00
Jonas Lincoln, Trustee.....	55	50	10 00
W. F. Bogart, Trustee.....	62	100	20 00
W. F. Bogart, Trustee.....	63	100	20 00
W. F. Bogart, Trustee.....	64	100	20 00
W. F. Bogart, Trustee.....	65	300	60 00
W. F. Bogart, Trustee.....	66	750	150 00
W. F. Bogart, Trustee.....	67	150	30 00
W. F. Bogart, Trustee.....	68	150	30 00
W. F. Bogart, Trustee.....	69	150	30 00
W. F. Bogart, Trustee.....	70	225	45 00
W. F. Bogart, Trustee.....	71	75	15 00
W. F. Bogart, Trustee.....	72	25	5 00
W. F. Bogart, Trustee.....	81	25	5 00
W. F. Bogart, Trustee.....	82	25	5 00
W. F. Bogart, Trustee.....	87	50	10 00
W. F. Bogart, Trustee.....	88	50	10 00
W. F. Bogart, Trustee.....	89	50	10 00
W. F. Bogart, Trustee.....	90	300	60 00
O. H. Bogart, Trustee.....	91	200	40 00
O. H. Bogart, Trustee.....	92	1000	200 00
O. H. Bogart, Trustee.....	93	1000	200 00
O. H. Bogart, Trustee.....	94	300	60 00
O. H. Bogart, Trustee.....	95	5	1 00
S. E. Holcombe.....	97	5	1 00
A. P. McDonald.....	98	5	1 00
A. P. McDonald.....	99	5	1 00
Cope, Uhler & Co, Trustees.....	101	25	5 00
Cope, Uhler & Co, Trustees.....	102	500	100 00
Cope, Uhler & Co, Trustees.....	103	500	100 00
Cope, Uhler & Co, Trustees.....	104	500	100 00
Cope, Uhler & Co, Trustees.....	105	100	20 00
Cope, Uhler & Co, Trustees.....	106	100	20 00
Cope, Uhler & Co, Trustees.....	108	100	20 00
J. E. Williams.....	110	30	6 00
D. Wilder.....	111	30	6 00
J. N. Hill, Trustee.....	119	100	20 00
Parker & Fry, Trustees.....	124	50	10 00
Parker & Fry, Trustees.....	125	50	10 00
Parker & Fry, Trustees.....	126	50	10 00
Parker & Fry, Trustees.....	127	50	10 00
G. H. Purdy, Trustee.....	135	100	20 00
G. H. Purdy, Trustee.....	137	100	20 00
H. W. Howell, Trustee.....	140	75	15 00
O. E. Eckerd, Trustee.....	141	150	30 00
N. O. Eford, Trustee.....	149	25	5 00
N. O. Eford, Trustee.....	150	25	5 00
N. O. Eford, Trustee.....	151	25	5 00
W. F. Bogart, Trustee.....	155	100	20 00
W. F. Bogart, Trustee.....	156	100	20 00
W. F. Bogart, Trustee.....	157	100	20 00
W. F. Bogart, Trustee.....	159	100	20 00
Sam'l Marks, Trustee.....	167	30	6 00
Sam'l Marks, Trustee.....	168	30	6 00
W. F. Bogart, Trustee.....	172	50	10 00
W. F. Bogart, Trustee.....	173	50	10 00
W. F. Bogart, Trustee.....	174	50	10 00
W. F. Bogart, Trustee.....	177	50	10 00
H. H. Noble & Co, Trustees.....	180	50	10 00
H. H. Noble & Co, Trustees.....	181	50	10 00
H. H. Noble & Co, Trustees.....	182	50	10 00
H. H. Noble & Co, Trustees.....	183	50	10 00
H. H. Noble & Co, Trustees.....	184	50	10 00
H. H. Noble & Co, Trustees.....	185	50	10 00
H. H. Noble & Co, Trustees.....	186	50	10 00
H. H. Noble & Co, Trustees.....	187	100	20 00
H. H. Noble & Co, Trustees.....	188	100	20 00
H. H. Noble & Co, Trustees.....	189	100	20 00
H. H. Noble & Co, Trustees.....	190	100	20 00
H. H. Noble & Co, Trustees.....	191	100	20 00
H. H. Noble & Co, Trustees.....	192	100	20 00
O. A. Schmitt, Trustee.....	193	100	20 00
O. A. Schmitt, Trustee.....	194	100	20 00
O. A. Schmitt, Trustee.....	198	100	20 00
O. A. Schmitt, Trustee.....	202	50	10 00
O. A. Schmitt, Trustee.....	203	50	10 00
H. P. Wood, Trustee.....	222	100	20 00
H. P. Wood, Trustee.....	223	100	20 00
H. P. Wood, Trustee.....	224	100	20 00
A. Tence, Trustee.....	227	75	15 00
H. P. Wood, Trustee.....	230	100	20 00
I. Case, Trustee.....	239	5	1 00
W. Turnbull & Co, Trustees.....	233	100	20 00
W. Turnbull & Co, Trustees.....	235	100	20 00
W. Turnbull & Co, Trustees.....	236	100	20 00
W. Turnbull & Co, Trustees.....	244	100	20 00
W. Turnbull & Co, Trustees.....	245	100	20 00
W. Turnbull & Co, Trustees.....	246	100	20 00
W. Wilkinson, Trustee.....	248	500	100 00
S. E. Holcombe, Trustee.....	249	500	100 00
E. Breze, Trustee.....	250	200	40 00
E. Breze, Trustee.....	251	200	40 00
E. Breze, Trustee.....	252	200	40 00
W. F. Bogart, Trustee.....	253	100	20 00
W. F. Bogart, Trustee.....	254	100	20 00
W. F. Bogart, Trustee.....	255	100	20 00
W. F. Bogart, Trustee.....	258	100	20 00
W. F. Norwood, Trustee.....	267	100	20 00
Jonas Lincoln, Trustee.....	269	50	10 00
W. L. Duncan, Trustee.....	270	50	10 00
W. L. Duncan, Trustee.....	271	50	10 00
W. L. Duncan, Trustee.....	272	50	10 00
W. L. Duncan, Trustee.....	273	50	10 00
W. L. Duncan, Trustee.....	274	20	4 00
W. L. Duncan, Trustee.....	275	20	4 00
M. Moritz, Trustee.....	276	10	2 00
M. Moritz, Trustee.....	277	10	2 00
M. Moritz, Trustee.....	278	10	2 00
M. Moritz, Trustee.....	279	10	2 00
M. Moritz, Trustee.....	285	25	5 00
M. Moritz, Trustee.....	286	25	5 00
M. Moritz, Trustee.....	287	25	5 00
M. Moritz, Trustee.....	290	50	10 00
M. Moritz, Trustee.....	291	50	10 00
M. Moritz, Trustee.....	292	50	10 00
O. P. Gordon, Trustee.....	293	25	5 00
Hill & Kilgour, Trustees.....	294	25	5 00
Wm. Maxford, Trustee.....	296	60	12 00
Wm. Maxford, Trustee.....	296	60	12 00
M. Moritz, Trustee.....	300	50	10 00
M. Moritz, Trustee.....	300	50	10 00
M. Moritz, Trustee.....	302	100	20 00
O. A. Schmitt, Trustee.....	303	50	10 00
O. A. Schmitt, Trustee.....	304	50	10 00
J. D. Parker, Trustee.....	305	100	20 00
W. F. Bogart, Trustee.....	307	200	40 00
J. E. Purdy, Trustee.....	308	50	10 00
J. E. Purdy, Trustee.....	309	25	5 00
W. F. Bogart, Trustee.....	310	100	20 00
W. F. Bogart, Trustee.....	311	100	20 00
W. F. Bogart, Trustee.....	312	100	20 00
W. F. Bogart, Trustee.....	313	50	10 00
W. F. Bogart, Trustee.....	314	40	8 00
W. S. Lyons, Trustee.....	315	50	10 00
W. S. Lyons, Trustee.....	317	20	4 00
W. F. Bogart, Trustee.....	318	150	30 00

Names. No. Certificate. No. Shares. Amt.

Ernest Anala, Trustee..... 322 150 30 00

W. Turnbull & Co, Trustees..... 325 75 15 00

W. Turnbull & Co, Trustees..... 326 25 5 00

Hale, Page & Wilson, Trustees..... 327 150 30 00

O. P. Gordon, Trustee..... 328 130 26 00

W. F. Bogart, Trustee..... 333 100 20 00

W. F. Bogart, Trustee..... 334 100 20 00

W. F. Bogart, Trustee..... 335 100 20 00

Chas. Athearn, Trustee..... 337 100 20 00

Chas. Athearn, Trustee..... 338 100 20 00

S. E. Holcombe, Trustee..... 339 100 20 00

S. E. Holcombe, Trustee..... 340 100 20 00

S. E. Holcombe, Trustee..... 341 100 20 00

S. E. Holcombe, Trustee..... 342 30 0 00

Riotte & Boyea, Trustee..... 343 100 20 00

Riotte & Boyea, Trustee..... 344 100 20 00

Riotte & Boyea, Trustee..... 345 100 20 00

Riotte & Boyea, Trustee..... 346 100 20 00

Riotte & Boyea, Trustee..... 347 100 20 00

Riotte & Boyea, Trustee..... 348 100 20 00

M. Moritz, Trustee..... 349 20 4 00

M. Moritz, Trustee..... 350 20 4 00

M. Moritz, Trustee..... 351 20 4 00

M. Moritz, Trustee..... 352 20 4 00

M. Moritz, Trustee..... 353 20 4 00

M. Moritz, Trustee..... 354 20 4 00

M. Moritz, Trustee..... 355 20 4 00

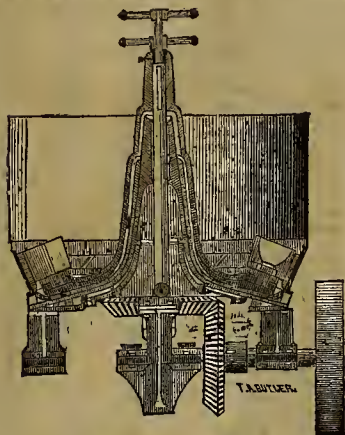
M. Moritz, Trustee..... 356 20 4 00

M. Moritz, Trustee..... 357

Iron and Machine Works.

Occidental Foundry,

137 and 139 FIRST STREET, SAN FRANCISCO



STEIGER & KERR,
IRON FOUNDERS.

IRON CASTINGS of all descriptions at short notice. Sole manufacturers of the Hepburn Roller Pan and Callahan Grate Bars, suitable for Burning Screenings. NOTICE.—Particular attention paid to making Superior Shoes and Dies.

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Iron and Locomotive Works,

INCORPORATED.....APRIL 30, 1868.
CAPITAL.....\$4,000,000.

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Manufacturers of Steam Engines, Quartz and Flour Mill Machinery, Steam Boilers (Marine, Locomotive and Stationary), Marine Engines (High and Low Pressure). All kinds of light and heavy Castings at lowest prices. Gams and Tappets, with chilled faces, guaranteed 40 per cent. more durable than ordinary iron.

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WM. H. TAYLOR.....President
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LEWIS R. MEAD.....Secretary

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MANUFACTURERS OF

STEAM ENGINES,

Quartz, Flour and Saw Mills,
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UNION IRON WORKS,
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ROSS' PATENT BOILER FEEDER AND SEDIMENT COLLECTOR

Dunbar's Patent Self-Adjusting Steam Piston PACKING, for new and old Cylinders.

And all kinds of Mining Machinery.
Front Street, between N and O streets,
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Heavy and Light Castings of every description. House Fronts, Mining and General Machinery estimated and constructed at shortest notice. On hand the celebrated Occident and French Ranges, Burial Caskets, Grates and Fenders, Road-Scrapers, Hydrants, Tuvre Irons, Ploughwork, Sash Weights, Ventilators, Dumb Bells, Gipsies, Ship Castings, SOIL PIPE of all sizes, Fittings and Cannon Kettles in stock at Eastern rates. SHOES and DIES a specialty. Ornamental Fences in large variety.

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129 and 131 Beale street, between Mission and Howard, San Francisco.

LIGHT AND HEAVY CASTINGS,
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IRON PIPE

FOR STEAM, GAS AND WATER.

Boiler Tubes

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LAP-WELDED PUMP COLUMN

FOR SALE BY

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DEALERS IN

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Black Diamond Steel,

Etc., Etc.,

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108, 110 and 112 PINE STREET, San Francisco.

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Patented May 26, 1868.

THE ONLY SAFE BLASTING POWDER IN USE.

GIANT POWDER, NO. 1,

For hard and wet Rock, Iron, Copper, etc., and Submarine Blasting.

GIANT POWDER, NO. 2,

For medium and sandy Rock, Lime, Marble, Sulphur, Coal, Pipe Clay and Gravel Bank Blasting, Wood, etc. Its EXCLUSIVE use saves from 30 to 60 per cent. in expenses, besides doing the work in half the time required for black powder.

The only Blasting Powder used in Europe and the Eastern States.

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Rolling Mill Company,

SAN FRANCISCO, CAL.

Established for the Manufacture of

RAILROAD AND OTHER IRON

Every Variety of Shafting,

Embracing ALL SIZES of
Steamboat Shafts, Cranks, Piston and Connecting Rods, Car and Locomotive Axles and Frames,

—ALSO—
HAMMERED IRON
Of every description and size.

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The highest price paid for Scrap Iron.

SHEET IRON PIPE.

THE

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Are prepared to make SHEET IRON AND ASPHALTUM PIPE, of any size and for any pressure, and contract to lay the same where wanted, guaranteeing a perfect working pipe with the least amount of material.

Standard sizes of railroad Car Wheels, with special patterns for Mining Cars. These small wheels are made of the best Car Wheel Iron, properly chilled, and can be fitted up with the improved axle and box—introduced by this company, and guaranteed to outlast any other wheels made in this State.

All kinds of Machinery made and repaired.

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Brass Foundry & Pump Factory.

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Sole Proprietor and Manufacturer of the
Celebrated Hudson Force Pumps, Atwood & Bodwell Windmill Brass Pumps, Smith's Copper-Lined Pumps, Plumbers' Force Pumps.

Special attention paid to Brewers', Distillers', Beer and Hot Liquor Pumps, and Wine Pumps. Particular attention paid to AIR PUMPS, also to

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Artesian Well Pumps Made to Order.
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OF ALL KINDS.

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STEAM PUMPS, STEAM ENGINES,

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Builders of QUARTZ, SAW AND FLOUR MILLS

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And General Machinists.

STEAM ENGINES AND BOILERS

Of all sizes—from 2 to 60-Horse power. Also, Quartz Mills, Mining Pumps, Hoisting Machinery, Shafting, Iron Tanks, etc. For sale at the lowest prices by

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Steam Engines and all kinds of Mill and Mining Machinery.

Also manufacture and keep constantly on hand a supply of our

Improved Portable Hoisting Engines,

From Ten (10) to Forty (40) Horse Power.

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ALL KINDS OF Brass, Composition, Zinc, and Babbitt Metal Castings, Brass Ship Work of all kinds, Spikes, Sheath Nails, Kadder Braces, Hinges, Ship and Steamboat Bells and Gongs of superior tone. All kinds of Cocks and Valves, Hydraulic Pipes and Nozzles, and Hose Couplings and Connections of all sizes and patterns, furnished with dispatch. PRICES MODERATE. J. H. WEED. V. KINGWELL.

Miners' Foundry and Machine Works,

CO-OPERATIVE,

First-Street, toward and Folsom, San Francisco.

Machinery and Castings of all kinds.

McAFEE, SPIERS & CO.,
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MANUFACTURERS OF

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ARTESIAN WELL PIPE.

Having the Latest Improved Machinery, we can make it an object to

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All Sizes Made and all Work Guaranteed

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Manufacturers of Files of every Description
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Sold by all the principal hardware stores on the Pacific Coast. 18v25.1y



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Ever Had in the United States,

BETWEEN COMPETITORS

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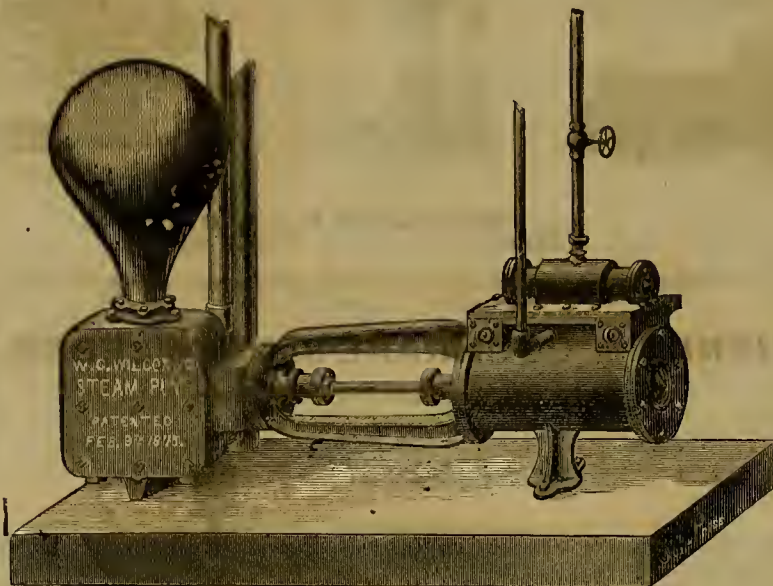
In which, at great expense, the different Steam Pumps were tried under every test known to experts, the Examining Committee of the Tenth Industrial Fair of the Mechanics' Institute have awarded to us their

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Best Steam Pumps on Exhibition.

We claim that our Pumps are the **best** ever made in **simplicity** of construction, economical use of power, **durability** and perfect adaptability for general uses, and we ask all persons interested to investigate **our** title to this claim.



AWARDED TO

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We are prepared to furnish PUMPS UNDER CONTRACT, guaranteeing their ability to perform any specific work for which steam pumps are adaptable, such as

RAISING WATER FROM MINES,

FOR WATER WORKS,

FEEDING BOILERS, RAISING WATER FROM WELLS; STEAMER AND SHIP PUMPS, ETC.

We would also call the attention of those interested, to our Direct Acting Deep-Well Pumps for raising water from

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Also to our Especial Construction of Pumps FOR HANDLING QUICKSILVER or heavy liquids.

W. C. WILCOX & CO., Proprietors.**PACIFIC MACHINERY DEPOT,****H. P. GREGORY & Co., Nos. 14 & 16 First Street,****San Francisco, Cal.**

P. O. Box 168.

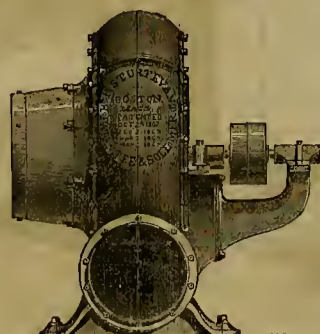
SOLE AGENT FOR THE PACIFIC COAST FOR

J. A. Fay & Co's Wood-working Machinery,

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Tanite Co's Emery Wheels and Machinery,

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Sturtevant Exhaust Fan for Removing Shavings and Sawdust from Machines.

Sturtevant's Blowers and Exhaust Fans,

J. A. Roebling's Sons Wire Rope,

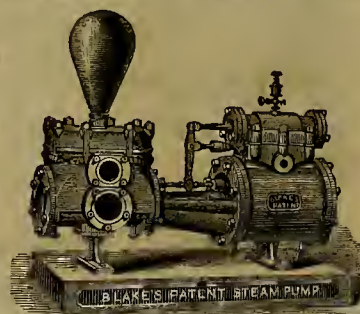
Pure Oak Tanned Leather Belting,

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Nathan & Dreyfus' Glass Oilers, and Mill and Mining Supplies of all Kinds.

BLAKE'S PATENT STEAM PUMP



Over 8,500 in Successful Use in the United States.

Parke & Lacy,

SOLE AGENTS FOR

Burleigh Air Compressors and Rock Drilling and Tunneling Machinery,

Putnam Machine Co. Machinist Tools and Wood Working Machinery,

Haskin's Steam Engines, Hoisting and Yacht, from 1 to 50 H. P.,

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Heald & Sisco Centrifugal Pumps for Irrigating and Wrecking Purposes,

Cosmopolitan Emery Wheels and Machinery,

Farmer's Dynamo-Electric Machine for Blasting,

And Hill's Celebrated Exploders.

310 California Street,

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Glasgow Iron and Metal Importing Co.

Have always on hand a large Stock of

Bar and Bundle Iron, Sheet and Plate Iron, Boiler Flues, Gas and Water Pipe, Cast Steel, Plow and Shear Steel, Anvils, Cumberland Coal, Etc.

WM. McGRINDLE, Manager, 22 & 24 Fremont St., S. F.

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A Mining Engineer, with the best of best of references, thoroughly experienced in the opening and superintending of mines and mills, desires an engagement. Address, "MINING ENGINEER," MINING AND SCIENTIFIC PRESS OFFICE, San Francisco.

Mining Superintendent

Of fifteen years' experience in working the most rebellious ores on the continent, desires employment. The gentleman thoroughly understands the opening and development of mines, and the construction of all kinds of machinery and appliances for the reduction of ores, and especially those termed rebellious. Can be communicated with through this office.

San Francisco Cordage Company.

Established 1858.

We have just added a large amount of new machinery of the latest and most improved kind, and are again prepared to fill orders for Rope of any special lengths and sizes. Constantly on hand a large stock of Manila Rope, all sizes; Tanned Manila Rope; Hay Rope; Whale Line, etc., etc.

TUBBS & CO.

611 and 613 Front street, San Francisco.

California Planers and Matchers, and Wood Working Machinery of all Kinds

California Planer and Matcher

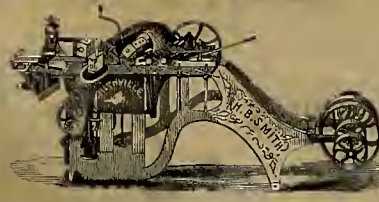
Is gotten up from new patterna specially for this Coast. It has Cast Steel Slotted Cylinder Head, running in patent self-oiling boxes; will plane 24 inch wide and six inch thick, and tongue and groove 14 inch wide. Will make rustic and stick gutters, or heavy mouldings, etc., and is the best job machine ever built. We have always on hand these machines with or without under cutter head, also, a large assortment of Planing Mill Machinery.



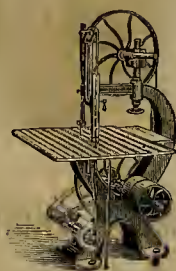
WITH LATE IMPORTANT IMPROVEMENTS.

Smith's Celebrated Molders.

We have four sizes of these Machines always on hand—"B," "C," "D" and "E,"—to work either three or four sides. Have slotted heads and all other improvements, and may be seen in any mill on the Coast. Prices reduced to 15 per cent. less than Eastern list. We have also, a large stock of all kinds of Planing Mill Machinery, such as Molders, Mortisers, Tenoners, Band and Jig Saws, etc. Send for our new Illustrated Catalogue. TREADWELL & CO.,



Smith's Celebrated Moulders.



Patent Band and Jig Saw

TREADWELL & CO.,

MACHINERY DEPOT:
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San Francisco.

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Church and Steamboat BELLS and GONGS,
BRASS CASTINGS of all kinds,
WATER GATES, GAS GATES,
FIRE HYDRANTS,
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GARDEN HYDRANTS.

A General Assortment of Engineers' Finding.
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STEAM PUMP

The Best and Most
Durable in use. Also,
a variety of other

PUMPS

For Mining and Farming
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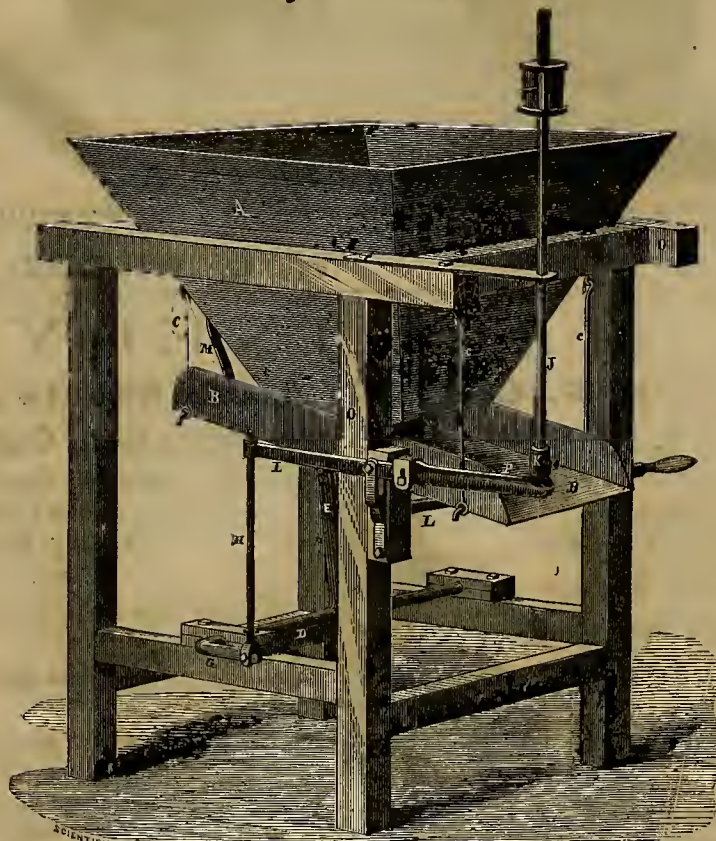


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SAN FRANCISCO, SATURDAY, JANUARY 15, 1876.

VOLUME XXXII
Number 3.

Colorado Bullion Product of 1875.

For the following information concerning the bullion product of Colorado in 1875, we are indebted to Mr. F. Fassett, of Central City, Colorado:

The complete bullion returns of the Central gold mining district (Gilpin county), are now in and show a product for 1875 of \$1,763,985.48, as against \$1,631,000 in 1874, and \$1,561,000 in 1873. Of the first named sum \$1,598,063.05 was gold, \$112,482.43 silver, \$51,000 copper, and \$2,440 lead. The stamp mills, of which between twenty and thirty were running at one

in 1876 as has never been known in her previous history.

The Boston & Colorado smelting works, at Black Hawk, produced \$1,947,000 in 1875. Of this \$1,356,000 was in silver, \$521,000 gold, and \$70,000 copper. The silver bars are 999 fins. The gold and copper are now shipped in bars instead of matte, the first one, worth \$23,800, having been shipped on Saturday. These works have just been enlarged and are now capable of treating 53 tons of ore daily, and the branch establishment at Alamosa has a capacity of 25 tons, comprising by far the largest establishment in Colorado. Their product in 1874 was \$1,638,000.

Among Colorado mines that have yielded from \$150,000 to \$300,000 each during the past

richer ore than the Gregory or Bobtail, but not so much of it. The profits are fifty per cent. of the gross product. The most profitable of the great silver mines at present are the Hukill and the Moose. Silver mining is just getting fairly under way and in a few years will show a yield ten times larger than that of the present time.

Central, Colorado, January 3d, 1876.

THE VIRGINIA COAL COMPANY'S NARROW-GAUGE RAILROAD.—The Virginia Chronicle says: "The surveys of the Virginia coal company's narrow-gauge railroad have been filed with the county recorder. The route is as follows: Leaving the divide, between this city and Gold Hill, the road bears around American Flat along the

Yellowstone Lake.

We present on this page an engraving representing Yellowstone lake, taken from Prof. Hayden's Government Reports on the geological survey of Montana, Idaho, Wyoming and Utah. Prof. Hayden, in speaking of the formation of the lake, says: The drainage of the country commenced long before the excavation of the present water courses, but it is difficult to answer the question how this great drainage was brought about, unless we account for it by a general elevation of the entire country, gradually sending this immense body of water, which must have prevailed all over the North-



YELLOWSTONE LAKE, (EAST SIDE.)

time and another, with an average of 440 stamps throughout the year, treated 100,000 tons of ore, yielding \$1,240,109.08, or an average of \$11.60 per ton. The Boston & Colorado smelting works obtained \$502,000 from Gilpin county high grade ores, of which \$357,000 was gold, \$94,000 silver, and \$51,000 copper. These works treated a much larger quantity of ore from other counties.

From the best attainable information so far received the yield of Clear Creek county for 1875 cannot be far from \$2,300,000, of Park county \$85,000, Fremont and the San Juan county \$300,000, all of these principally silver. Boulder gives over \$700,000, five-sevenths of which is silver, and Lake and Summit counties will foot up, principally in gulch or placer gold, \$300,000.

These figures which cannot be many thousands out of the way, make a grand total, with Gilpin county already received, of \$6,213,000 for 1875, as against \$5,362,000 in 1874, and \$4,050,000 in 1873. Over three-fifths of the above was silver. From the amount of capital coming into Colorado, the extensive mining enterprises on foot, and the erection of mills and preparations for mining on a large scale in all directions, the leading industry of Colorado cannot fail to make such an advance forward

year are the Gregory and Bobtail (gold,) at Central, and possibly the Gunnell; the Pelican and Dives and the Hukill (silver), near Georgetown; the Moore, in Park county and the Caribon, in Boulder county, both silver. Besides thousands of lodes worked on a small scale there are scores of mines that are paying many thousands of dollars annually, and occasionally tens of thousands. The older mines in many districts are being sunk downward rapidly.

The Ophir-Burroughs is down 918 feet. Six or seven other gold mines near Central have depths of from 600 to 740 feet, three of which are to have their lower workings extended down to depths of 900 or 1,000 feet. Machine drills are being introduced here, by which it is hoped a great saving in time and money may be effected.

The total cost of mining and milling on the Briggs part of the Gregory is \$4.50 per ton, and on another part of this lode and on the Bobtail and Leavitt, \$5 per ton. Average yield of mill ore, from \$7 to \$12 per ton; width of veins, from five to fifteen feet in each; number of men employed on the three lodes, nearly 400. Besides 170 tons of mill ore raised daily, fifteen tons or more are sent daily from these lodes to the smelting works, where an average of \$100 per ton is paid for it.

The Kansas and Burroughs are yielding much

dividing ridge between the Flat and Washoe valley, at a height of eight feet above the lowest sag in said ridge. It strikes the valley not far from the Mound house and the track of the Virginia and Truckee railroad, and reaches Carson City in thirteen and a half miles. It is expected that trains will run from this city to Carson in thirty minutes. From Carson to the mine of the company on El Dorado canon is nineteen miles. The road will pass through Mineral valley, and crossing the Carson river near McTearughan's bridge, go up through Mineral pass one and one-half miles above the coal mine. Between Carson and the mine is a natural grade where little is to be done but to put down the ties and rails. The heaviest grade on the whole road is but 138 feet, and the cost per mile will be about \$11,000."

THE Centennial mine, on the Comstock, is about to be started up actively. The superintendent is now in the city for the purpose of shipping up the hoisting machinery already ordered for the mine, and active work will be commenced immediately in the sinking of a first-class three-compartment working shaft.

MR. ROBERT M. FRYER has purchased the Glenbrook property, half way between Grass Valley and Nevada City. The new residence is near to the new reduction works.

west at least, perhaps all over the Rocky Mountain region, westward into the Pacific, and eastward into the Atlantic. As the waters slowly subsided they were separated into lakes of greater or smaller size, and then came the excavation of the grand canon, which slowly drained the great lake basin above the falls, so that now we have only the comparatively small remnant, the Yellowstone lake, shown in the illustration.

ON the North Consolidated Virginia mine during the past two and a half months the shaft has been sunk to a depth of 630 feet. Solid, comfortable hoisting works, blacksmith shop, carpenter shop, and an office for the foreman, have been erected, the total cost of the whole amounting to only \$44,109.67, showing a close and economical management that reflects great credit on the superintendent, Mr. D. H. Jackson.

THE water is entirely drained from the 2200-ft level of the Savage mine, and the drifts are being repaired and put in the best condition possible previous to commencing to cross-cut the ore vein in that portion of the mine.

SOUTH mountain, Idaho, is almost deserted, the works being all closed down. Business is entirely suspended.

CORRESPONDENCE.

Bingham Canon Mines.

MESSES. EDITORS:—Since my last communication mining matters here have assumed a much more cheerful aspect, with undoubted assurance of continuance. Every mine that has ever been productive is now being worked with better success than before in regard both to quantity and quality of ore. Many "holes in the ground," that their owners called mines in their efforts to sell them, have really been proven such on a little further development, consequent upon their failure to sell or engage capital. It seems now altogether probable that of the three thousand locations made in this district a large proportion will ultimately prove good mines, although the difference in depth at which the ore is struck in them is very great. On the eastern slope of the hills facing the valley, and some two miles from the town of Bingham, several milling ore lodes were found in the past fall, that are well defined, of good size and assaying \$35 to \$60 per ton in silver, and \$18 to \$20 in gold. In prospecting heretofore many of these veins had been opened, but as they showed no galena they were passed as worthless. One of these, the Mayflower, has been opened to a depth of 300 feet, at which point the vein is about fifteen feet thick, and has continued, from 150 feet from the surface to the bottom, of the average assay value of \$85 to the ton. The Winnebago, in the same vicinity, is of about the same character, but larger so far as developed. This class of mines will conduce more to our prosperity than those before known. Most of the ore in them is of about the hardness of chalk, yellow and brown, containing nodules of flint and fragments of quartz. The formation is the same as that containing the smelting ores. Mr. C. G. Ferguson, superintendent and an owner in the Mayflower, has placed substantial hoisting machinery thereon and is pushing ahead energetically. The only complaint now prevalent is the difficulty of transportation; the tramway running to the Bingham Canon railroad, it is said, does not keep the dumps clear of ore, and as the wagoners had drawn off on the completion of the former and engaged in other occupations, they are in something of a "pickle" at present.

A report, apparently reliable, comes to us that an extensive mining locality has been found near San George, in the southern part of the territory, the ores being of chloride and horn silver, the geological formation being sandstone. Now this will strike most of our readers as an anomaly, but it is not an impossible occurrence, nor unprecedented. At one or two points in Mexico the same has been found. In looking over the proceedings of the Association of American Geologists and Naturalists for April, 1845, I see a paper that was read by Dr. Jackson, giving an account of silver and copper mines occurring in sandstone in Nova Scotia and in the Lake Superior region; his deductions being that the fissures are filled with their mineral contents from below by injection, an old theory, but one that will account more satisfactorily than any other in most instances for the phenomena of mineral lodes. We will not yet draw comparison between Utah and California as regards mineral wealth, but will hold on to a "mental reservation" to do so at any time in the future.

WILLIAM TEAL.

Industries of Sacramento.

MESSES. EDITORS:—When I left San Francisco I promised to write you a statement of the manufacturing interests of this city and what the prospects for improvement were in the future. I hardly feel myself competent to predict the future of so large and prosperous a city as Sacramento. I believe that in all branches business is as good as it has ever been in the past, and judging from the way capitalists are taking hold and expending their capital in business pursuits, that the future is a great deal brighter than it has been for years. The time has now come for California to do its own manufacturing, and in a few years the large importation of farming implements and like goods will be a thing of the past, and will be a saving of over two million dollars per year.

At the present time Sacramento is manufacturing all cast iron goods that are needed. There are two large foundries, the Union and Mr. Gettenberger's. They have apparatus for raising large castings and all the modern improvements for casting large pieces.

Situated a few blocks from these foundries is a box factory, owned by Messrs. Cook & Gregory. Last season they found the building inadequate for their increasing business, and have commenced the work of enlarging it.

Mr. M. R. Rose's machine shop, situated on K street near Ninth, is doing a good business.

There has lately been formed the California carriage manufacturing company, who are now erecting a very large four-story building on the corner of Eighth and K streets, where they intend making all kinds of carriages and wagons.

They expect to be ready to commence work by spring. There are several other carriage and wagon manufactories, also furniture manufactories.

The railroad shops, situated in the north-west portion of the city, are doing more work at the present time than ever before, and furnishing employment for a great many men.

We have but one implement manufactory in this city, the Sacramento plow company. It was organized less than a year ago, and now ranks in the head of the class in this State. They have the latest improved and best machinery for the business, with a thoroughly skilled mechanic at the head. The right man in the right place is essential to all successful enterprises. This factory has turned out since it was fairly got under headway about two hundred plows per month, besides a great variety of harrows, cultivators, etc. The company have agents all over the State, and the Iron King gang plow, manufactured only by this company, has already become a standard plow of the Pacific coast. The company have a foundry of their own where the finest castings are made. The works are driven by a twenty-five horse-power engine and everything is as complete as possible. The profits of the business is satisfactory to the owners, and the works will be enlarged from time to time as the demand increases. Yours truly, F.

Mass Meeting in Relation to Mining Debris.

An adjourned meeting of the citizens of Sutter and Yuba counties was held on Friday afternoon, December 24th, at the City Hall in Marysville.

The meeting was called to order by Judge Craddock.

Dr. S. R. Chandler, of Yuba City, chairman of the committee to draft a bill to be submitted to the Legislature, to prevent the further destruction of the valley farming lands and the navigation of the Sacramento and Feather rivers, presented for the consideration of the meeting a bill, the main features of which were: That it should be a misdemeanor for hydraulic miners to hofond and fill with sediment from their mines the waters of the rivers. That employer and employee should be held equally guilty and responsible in a civil action for damages, and a judgment for damages when rendered should be a lien upon all the mine and the machinery and appurtenances, and should take precedence of all other liens. That the second offense should be punishable by fine or imprisonment, or both, in the discretion of the court. The doctor stated that he had submitted his draft of a bill to several legal gentlemen, who thought it sufficiently comprehensive, but that in its present form would be difficult to enforce. He maintained his position with ability, and argued that self-protection was the first law of nature. That the farmers had bought their lands of the government, settled and improved them in good faith, and were entitled to protection. That we might bankrupt ourselves building levees which were at the best but temporary protection against encroachments of the sediment. That unless something was done immediately we should see a large portion of the finest lands in the State turned into a desert, and the inhabitants, with blasted hopes and shattered fortunes, fleeing from their once happy homes.

Judge I. S. Belcher, one of the legal gentlemen of the committee, being called upon, said that since his appointment upon the committee he had not had time to fully consider the question so as to be fully satisfied in his own mind; that the matter was beset by many difficulties, both from a legal and financial standpoint; that hydraulic mining had now such approved appliances for moving earth that it was comparatively easy to send a large quantity down upon the cultivated lands, carrying destruction and desolation; that in law there was no principle better settled than that every man should so use his property as to not interfere with and injure his neighbor; that the hydraulic miner was injuring his neighbor was clear, but that the best remedy was not so clear; that he was willing to co-operate with the committee and give them all the assistance in his power.

W. H. Parks said it was high time that something was done. That the State could not afford to see so much of her best territory destroyed. That many well-to-do farmers had already been broken up by the sediment from the mines upon their farms. That the navigation of the Sacramento and Feather rivers was being ruined. That he with others well remembered when to be "a good miner was much greater than to be a good, honest farmer." But the thing was reversed now. That the State now must look to agriculture as one of her greatest and most permanent sources of prosperity and wealth. That he was not in favor of one industry being built up at the expense of the other; and that it was not just to use the farmers' fields as a dumping place for the mining sediment. That as a business proposition it would be better for the State to buy every hydraulic mine and pay every dollar it was worth than to permit the valley lands to be ruined as they soon would be; but he doubted whether that would be practicable, as there would be countless worthless claims for worthless mines. That the hydraulic miner was in a condition that we should carefully

consider. He has his money and business in his mine. He is sending his sediment on our lands, but are we ready to say he shall stop immediately? Are we ready for so radical a measure at once? For one, I dare not say it. I doubt whether any man here will say it, while we all feel that we are suffering a great hardship. The question is beset with many difficulties; but I believe there is a remedy, and I will cheerfully support any measure that offers the needed relief.

J. H. Keyess said: "I have no objections to the miners digging out all the gold they can find, but I don't want them to send the whole side of a hill down upon my ranch and bury me and all I have. And that is just what they have done and are doing. I want to be let alone. I don't know much about law nor don't want to. If it is the law that one man shall use his property so as not to injure his neighbor, I should like to see that law put in force. As far as I can learn, when you go after a miner for damages the miner says, 'I have not damaged you; how do you know that my sediment is on your land? There are others mining.'" Mr. K. thought a law should be passed making any miner that threw sediment into the river where it would come upon a farmer's land, responsible for all the damage, and the putting of sediment into the river evidence of such damage.

Dr. Wilkins agreed with the other speakers in that it was a very great evil, and should engage the serious consideration of all the people, and hoped that some relief may be found.

J. L. Wilbur, in suggesting a remedy, said the Legislature might find it expedient to appoint a commission to visit the localities of the mines and see if possible whether cheap and worthless lands might not be found where their washings could be conveyed to where they would at least be no injury if they did no good.

George Ohleyer was in favor of any move or compromise that would save the agriculture of the State. This being now by far the greatest interest in the State, it should receive the fostering care of all those who look upon California as the permanent home of themselves and posterity. To show what had already been destroyed, he submitted the following figures:

Twenty-four sections of land destroyed on the Yuba river—15,360 acres—valued at \$200 per acre.....	\$3,072,000
Personal property and improvements.....	5,000,000
Loss and depreciation of property in Marysville.....	2,000,000
Destruction on Feather river.....	500,000
Eighteen sections on Bear river—11,520 acres—valued at \$100 per acre.....	1,152,000
Destruction in Yuba county.....	9,724,000
Assessed value of all property in Yuba county for 1875.....	5,025,720
Assessed value of all mining property in Yuba county in 1875.....	298,600
Destruction of property in Sutter county—eighteen sections of land on Bear river—11,520 acres, valued at \$100 per acre.....	1,152,000
Personal property and improvements.....	1,000,000
Destruction in southern portions of the county, Coon creek and Auburn ravine.....	500,000
On Feather river on both sides.....	500,000
Total in Sutter county.....	\$3,152,000

The speaker estimated the total amount already spent by the building of levees to protect what is not yet wholly destroyed, at \$1,000,000. And these works, he claimed, were as yet protecting \$20,000,000 worth of property. But the filling up of rivers is gaining on our ability to levee it out, making it perfectly plain that all must soon go together. For these reasons he held that should no remedy occur short of stopping the mines, that mining should stop. Three hundred thousand dollars of mining property should not be allowed to menace and destroy property assessed at \$10,000,000, besides destroying our rivers and harbors.

On motion it was ordered that W. H. Parks, Judge Crane and Judge Filkin be added to the committee heretofore appointed to draft a bill to be presented to the Legislature, making it unlawful to flow mining debris into Bear river, Yuba river or Feather river, or their tributaries, and making any and all hydraulic mining companies so flowing debris in said streams answerable in proportion to the amount so thrown into said streams for the damage caused thereby. Also, to ask the Legislature to investigate by appropriate means this subject in order that some plan may be adopted by which the destruction occasioned by hydraulic mining on said streams may cease. And to ask the Federal Government for appropriations to keep open for commerce the navigable streams of the State rendered unnavigable by hydraulic mining.

On motion, the meeting adjourned till Saturday, January 8th, at twelve o'clock, to hear the report of the committee and take action thereon.

J. H. CHADDOCK, Chairman.

GEORGE OHLEYER, Secretary.

TUSCARORA DISTRICT.—Tom Rule recently arrived from this district and reports that everything is looking favorable, but they have been obliged to suspend operations for a while in consequence of bad weather, snow and the difficulty of getting supplies to the camp. Elko is the shipping point for this camp, but the roads, especially over the Summit, is so very bad and impassable in winter that it is impossible to get supplies in there during cold weather. It is now in such a bad condition that it is utterly impossible for the stage or other teams to pass over the route, and if some other road is not laid out all work in that district will have to be abandoned for the winter.—Humboldt Register.

Prospects of Coso District.

The Coso Mining News says: About one year has elapsed since the mines of this district were discovered, but it is only within a very few months that any legitimate attempts have been made to open them up and make them productive, and even the few enterprises inaugurated for that purpose can yet be counted upon the fingers of one hand. These few operations are even yet in their infancy and we are consequently far from occupying a self-sustaining position, but our prospects are brilliantly promising in the extreme and in a few weeks more will be demonstrated our ability to return large profits in any legitimate mining enterprises properly conducted and honestly managed. It takes time to inaugurate mining enterprises even when capital is idle and obtainable; and when the reverse is the case, as has been during the time since our resources have become known, it is extremely difficult to place mines upon the market and secure funds to work them. That we have already done as much as we have is a matter of surprise to those familiar with the difficulties to encounter and should be a subject of congratulation to all who have cast their lot in a section of such mighty resources as this contains. There has not yet been one legitimate undertaking attempted but what is more promising to-day than when commenced; this is conceded by every one who is well informed, and that such is the case is a fact not paralleled in the history of silver mining elsewhere. This assertion may appear almost incredible to some, but we speak whereof we know from a personal experience in the silver mines of this coast during a period of twelve years past in nearly every locality where the mines have obtained any prominence. That ours should be the exceptionally favored place is really a wonder and is accounted for upon the simple fact of our mineral deposits being of grand dimensions, far beyond the average richness and practically inexhaustible. With such a foundation upon which to base our wealth and future prosperity we can contentedly await the introduction of more capital that is even now headed this way and while, during the immediate present, resuming the benefits of more prosperous times than any new mining locality ever before had to boast of, we can confidently prepare for substantial and long continued prosperity to attend us in the future. With facts upon which to base such brilliant and satisfactory predictions none should hesitate to forward improvements and lay the foundation for a competence so easily attainable. No mining locations should be left unworked; though circumstances may be such as to limit the endeavor and cause the results to look meagre, all should receive attention, for herein consists our only source of wealth, and we must not allow the opportunities to pass while they are within our grasp. We should recollect that the era of new discovery in the United States is rapidly passing away and that very soon, perhaps during the lives of our children, the history of the prospector will have become a thing of the past and the wonderful opportunities of leaping from poverty to affluence by a single stroke of the pick will be foundation matter for future romances rivaling the wonders of Aladdin's lamp. We are living in an age of marvellous change, in which wonders multiply so rapidly that the senses are bewildered and when we carefully review the causes which lead to this

"Strange Mysterious change,"

We find our own locality surrounded with advantages that properly fostered will prove us the central figure of this extraordinary age. Therefore it behooves us to nourish the opportunities now within our grasp, for such rare advantages as we enjoy will perhaps with the present century pass away; the silver girdled mountains will have become the property of wealthy corporations, and the miner of to-day with chances of becoming a representative magnate among the money kings, will find himself circumscribed to the sphere of the stereotyped laborer with nothing to beneath his children but the hard knocks and wrinkled brow of care that embittered his life and prematurely hurried him under the sod.

NEWSPAPER AND SCHOOL EDUCATOR.—The newspaper is, without doubt, a powerful instrument for good or ill, according to the kind of newspaper meant, but it is no part of its mission to supplant the school. It is the business of the daily journal to print the news, to comment upon the occurrences of the day, and to advocate that which its conductors believe to be the right in all matters of public and general concern. The business of the school lies in a totally different plane. It is its province to train the faculties of boys and girls into ready and accurate modes of action, and, so far as mere information is concerned, to furnish them with a certain technical, elemental, basilar species of knowledge upon which their disciplined faculties may build as upon a foundation wall. The information which the school furnishes, the newspaper does not; that which the newspaper gives, the school cannot and ought not; and hence, even in this matter of giving information, the only one in which there is the least resemblance between the respective functions of the school and the journal, it is resemblance only, and not identity.—Evening Post.

MECHANICAL PROGRESS

Iron in Architecture.

When iron fronts were first introduced it was strenuously asserted by some that expansion and contraction would dislocate the joints and render a building unsafe. An examination of one of the numerous cast iron structures which, for a number of years, have been exposed to every change of atmospheric temperature without, and to the heat of steam boilers, etc., within, will show everything unchanged. Events have also proven in the cases of burning of storehouses, filled with combustible goods, that cast iron fronts are absolutely fire proof, and will neither warp nor crack, nor fall down, unless the entire building falls, pulling the front with it. Only let it be remembered that, in addition to a high and intense heat, the use of a blast is required to reduce cast iron to a molten state, and the ability of iron fronts to stand heat will be readily understood. Iron fronts have stood erect in cases where the side brick walls were entirely thrown down and demolished by the elements.

A front of iron is usually laid down and fitted together complete in the manufactory previous to erection at the building. It can be transported to any distance to the place of erection and put together with wonderful rapidity, and at all seasons of the year. It takes up less space than any other material, and so enlarges the interior of the building. When it becomes desirable to tear down the building itself, to make way for other improvements, the iron front may be taken to pieces, without injury to any of its parts, and be re-erected elsewhere with the same perfection as at first. Instead of destruction there need be a removal only.

Iron has in its favor unequalled advantages of ornament, strength, lightness of structure, facility of erection, durability, economy, incombustibility and ready renovation.

Mach has been said against iron from misconception. It is exceedingly difficult in the minds of most writers and talkers who use sweeping denunciations and citations against iron, to separate wrought iron and cast iron in their respective endurances against weather. Wrought iron rapidly oxidizes when exposed to the atmosphere, and goes to decay. Cast iron, on the contrary, slowly oxidizes in damp situations; rust does not scale from it, and the oxidation, when formed, is of a much less dangerous kind than on wrought iron. A coating of paint will counteract whatever tendency cast iron has to rust when exposed.

Whatever has been done in iron which deserves censure from critics, can be remedied. Let it not be forgotten that the material is not at fault but the workmanship. Iron can be made to imitate anything perfectly. Men who have said the most against iron have been they who knew the least about it. Arguments have been made that iron is a sham, but a stone building is a greater sham, because it leads one to believe that it is all stone, when in fact it is usually nothing but a veneer set up against a brick wall.

When the public become thoroughly acquainted with the advantages iron possesses as a building material, it is confidently predicted that for superior buildings of all kinds, it will receive a general preference to granite, marble, sandstone or brick.—*Condensed from Iron Age.*

Painting Iron Fronts.

A great deal has been written about the color to paint iron work. Iron being a material which requires a coating of lead and oil, it is proper to give it any color that good taste may suggest. The color will often be regulated by the color and hue of adjoining buildings or other surroundings. Because marble is white or sandstone brown, the painting of iron work in these colors must not be prohibited. What is to be condemned is the graining of iron in imitation of marble and sanding in imitation of stone. Tints and colors and gilding produce rich and sparkling effects, but great care and exceeding good taste must be exercised or failure will be the result. The best pigments must be used, or the colors, exposed to the air and sun, will fade rapidly—and the best do fade—and leave the front shabby. Wherever practicable, iron work should be painted inside and out, without delay. Particular care in this respect should be given to all parts put together in pieces, as cornices, trusses, etc. These should have their joints well painted before being bolted or riveted together. Painting on the inside, however, applies only to the shell parts. Columns cannot be painted on the inside, nor do they need it. Columns stand over column with an intervening plate; the very construction makes of the inside of a column an almost air-tight chamber, where the air is always dry and always of one temperature. No oxidation takes place under these conditions, and so no paint is necessary. The inside of a column is covered with a coating of foundry sand, which clings to it for ages. On the shell work, when the paint has fairly reached every crevice, these parts, too, become air-tight, and paint only becomes requisite on the outside, and to brighten up the color. In applying ornaments, such as leaves of capitals, etc., not only should the ornaments themselves be first thoroughly painted, but the screws which fasten the ornament to the main work should be dipped in paint as well. After drilling a hole in iron, the burr around the hole

should always be filed away, so that no streaks of rust from rain water down the face of the building will tell of carelessness in this respect. A lack of care in such little matters often causes the greatest annoyance, and has been the obnoxious reason why iron fronts have had to be painted more often during the ensuing few years of their erection than afterward. Some fronts in a dark color have only been painted for intervals of five years during the past twenty years, and previous to that did not average more than once in two years. For the first coating of iron nothing is superior to oxide of iron mixed with oil, or what is known as metallic paint.—*Iron Age.*

Sixty vs. Thirty-Foot Rails.

The statement made by us some weeks since that the Edgar Thomson steel works had not only rolled a specimen sixty-foot rail but had filled an order for some of the same length, has called out considerable discussion as to their superiority over the ordinary thirty-foot rail, which has generally been in favor of the sixty-foot. In the first place they of course cost no more per pound than the thirty-foot, and even less, while two crop ends are saved. This is an item of no small moment. How to use crop ends economically is one of the serious problems at Bessemer works. Two thirty-foot rails give four crops, and a sixty-foot but two, which at once takes out of the question fifty per cent. of the difficulty. With a view to this cheapening of production by reducing waste these works were designed to make sixty-foot rails.

The saving in their use by railroads is not so evident, but it would doubtless be found more economical to use the longer rail. The cost of laying them will be less and the wear and tear of rolling stock as well as the rails themselves will be much lessened. A larger part of this wear and tear is due to the "hammering" caused by the shock in passing from one rail to another, and on a track with sixty-foot rails the number of joints will be lessened one-half.

Some of the sixty-foot rails ordered have been for laying on bridges, on the supposition that reducing the number of joints will reduce the strain on the parts of the bridge.

What the effect of expansion upon a track laid with these longer rails will be is doubtful. Of course with only half as many joints the distance between the rails allowed for expansion and contraction will have to be greater, but in arranging the track for hot and cold weather only half as many joints will have to be extended to.—*American Manufacturer.*

A New Style of Ship Building.—"Composito."

There was recently launched at Baltimore, for the United States coast survey, a "composito" vessel, that is, a vessel built partly of iron and partly of wood. It appears that this vessel was built upon recommendation of Capt. Patterson, of the coast survey, whose views on the subject are of interest in addition to our knowledge of the important questions affecting the ship building trade. He says that experience has shown "composito" vessels to be more economical and more durable than vessels built either entirely of iron or entirely of wood, and that this is more especially the case in our Southern waters. In the "composito" built, the frame and beams are of iron, and the planking of wood. The waters of the Southern coast are found to seriously affect iron hulls, so that after about eight years the iron fails. Five or six years ago two small "composito" vessels were built for the coast survey, in Baltimore, and they have proved very successful; one of these, the *Bibb*, withstood the terrible cyclone which recently destroyed Indianola. She was subjected to its full severity for ninety hours, but passed through it unscathed. In the period of nearly six years that they have been afloat, the repairs to these two schooners have not exceeded \$600. Subsequently another "composito" schooner of 125 tons was built, and afterward a "composito" steamer of 200 tons. Captain Patterson thinks that this class of vessels will in time be generally used, on account of their much greater durability than wooden vessels, which much more than balances the somewhat heavier first cost.

A NEW STYLE OF BRIDGE.—The recent discussions on the subject of widening London bridge, and the anxiety which prevails to provide suitable means for relieving the present congested state of the traffic crossing the Thames, has brought forth several schemes for effecting that object. Among others is a proposed new bridge, patented by Mr. F. Barnett, O. E., who, not long since, explained the plans and designs of it to a gathering consisting of gentlemen interested in the shipping and carrying trades of the port of London, engineers and others, at 104 Queen Victoria street. The bridge is constructed on girders, and double openings are placed at intervals throughout its length, into which large ships can enter through gates conducted on dock principles. The scheme is simple in its arrangement, and the chief advantages claimed for it by the inventor are that it can be constructed at a comparatively cheap cost, without having the effect of depreciating the valuable wharf property that exists on both shores below London bridge; that it will obviate great loss of time, and wear and tear of horses and vehicles, and that it permits of the passage of ships without necessitating the stoppage of vehicular or pedestrian traffic for a moment.

SCIENTIFIC PROGRESS.

The Interference of Light.

The undulatory theory of light is now universally admitted to be the true one, and by it many things may be accounted for which otherwise have no rational explanation. Among them may be mentioned the subject of the interference of rays of light. Tyndall has defined the interference of light as follows, viz:

"The action of one system of waves upon another, whereby the oscillatory motion is either augmented or diminished, is called interference. In relation to optical phenomena it is called the interference of light."

Bearing in mind that the same general laws apply to light and sound (and, to a certain extent, to water) we must at the same time distinguish between the motion of the wave and the motion of the individual particles which constitute the wave. For, while the wave motion may be propagated through long distances, the motion of the particles is confined to a small orbit. In the case of an object floating on water—while the wave rushes on the object is not carried with it, but appears to move up and down.

So it is in a wave of light, the motion carries the particle of ether up and down, and this distance which the particle moves up and down, is called the displacement or amplitude. One thing, however, must be borne in mind, i. e., that the action of a wave of light is in every direction from the source, so that the wave front is a sphere, and the illustration given above of an object on the water would only apply to one point in one part of the wave. Now, in the case of light proceeding from two different sources, it can easily be seen that the waves from one must have an effect upon those from the other.

Tyndall illustrates this by taking the case of two stones dropped into still water at the same time. Little waves will begin to radiate from each in circles; at some point the first, or outside ripple from one stone will reach the first ripple from the other. Now, it will be seen that if the crests of these two happen to meet, the tendency of both is to "push up," or, if the furrows meet, the effort of both is to "push down," and the result will be that when crest coincides with crest, or furrow with furrow, the height of the crest and the depth of the furrow will be twice that of either alone.

If, on the other hand, the two ripples happen to come together in such way that the crest of one strikes the furrow of the other, the tendency of one will be to elevate while that of the other will be to depress; and, supposing the two waves equal, the result will be that the two actions will counteract each other, and stillness will be the result.

This phenomena of motion added to motion, producing no motion, is called interference; and when these phenomena relate to light, they are called the interference of light, and by the principle of interference are explained some of the most beautiful phenomena in nature.

A Valuable Gift by Chemistry to the World.

A celebrated physician, the late Dr. Valentine Mott, used to say that iodine was the greatest gift which medicine had ever received from chemistry; and it may now be said that one of the most remarkable and important services rendered by chemical investigators to the arts and sciences is the discovery of bromine, by Balard in France, just fifty years ago. Berzelius, while describing it in his "Chemistry," mentions that no use had been found for it, but he cautiously adds the words "thus far," showing that he confidently expected that a use would ultimately be found. The discovery was fruitless for a period of fifteen years, when daguerreotype was invented; and bromine soon took an important place as one of the most valuable ingredients in the necessary materials, and now bromine compounds are indispensable to the photographer. Another fifteen years elapsed; and then physicians commenced to experiment with the new element, and they soon ascertained its great value as a remedial agent, and the salts of bromine now form a series of the most important substances in the materia medica. Lately it has been found that bromine and some of its compounds are the very best etching materials for engraving metals, surpassing all acids and other agents. But there is no reason to believe that this will close the list of the uses of this remarkable elementary substance, which is found in sufficient abundance in the waters of the sea and of many saline springs to make it comparatively cheap.

Bromine is commonly obtained from the mother liquor or bitters of salt works, which is rich in bromine compounds, the latter being retained in the liquor, as they do not crystallize out as easily as the chloride compounds, of which common salt is the principal. Pure bromine is a virulent poison. When a small piece of phosphorus is thrown on a few drops of bromine in a tall beaker glass, it is at once violently projected upward with an explosive noise, and in an ignited condition; this forms a striking lecture room experiment, illustrating the effects of very active chemical affinity.

Bromine is a very disagreeably smelling brown liquid, freezing at -8° Fah., and boiling at 150° , when it changes into a deep red vapor,

nearly six times heavier than the air. The production of bromine at present equals 245,000 pounds, of which the United States and Germany produce the greatest part, namely, 100,000 pounds each. Scotland produces 30,000 pounds, and France 10,000 pounds.—*Scientific American.*

Deep Sea Soundings.

Not so many years ago it was considered a feat in deep sea sounding to reach a mile or a mile and a half, and even then, after allowance had been made for the action of currents upon the line, the actual depth attained was a good deal matter of calculation and guess. Breakages also were continually occurring in the hauling up, from the necessary slenderness of the cord in comparison with the weight of the lead. The modern method by which the lead detaches itself at the bottom meets that as well as several other difficulties nearly as important, and the wonder is that it was not thought of sooner. Now there is scarcely any limit to the depth of soundings, except the depth of the sea, which the recent explorations of the *Challenger* go far to show to be in accordance with the theory that its greatest depth is equivalent to the height of the highest elevations above its level.

The deepest sea soundings yet effected were obtained by the *Challenger*, in the abysses off New Guinea, depths which have occasioned a sharp line of demarcation between the fauna of Asia and Australasia. The "lead" weighed four hundred pounds, and struck bottom at the tremendous depth of 4,575 fathoms, or a little over five miles. The hollow rod, by which specimens of the bottom are brought up, was full of mud, and both the thermometers that had been sent down were smashed to atoms by the enormous pressure of the superincumbent water. A previous unsuccessful attempt to reach the bottom, but in which 4,545 fathoms were sounded, showed the temperature at that depth to be $35\frac{1}{2}$ degrees Fahr.

In the attempt to ascertain the temperature at this great depth, three out of four thermometers that had been sent down were crashed by the enormous pressure of the superincumbent water, amounting to over six tons to the square inch.

Piano wire is now used instead of cord for deep sea soundings, and has done excellent service in recent submarine cable expeditions.

Pressure and Compressibility of Water.

Oerstedt of Copenhagen, who in 1819 discovered the relation between electricity and magnetism, a discovery which was the first step in the invention of the modern telegraph, was the first who practically demonstrated and measured the amount of compressibility of water and other liquids, by means of an apparatus still named after him. It consists of a small hydraulic press, of which the piston is pressed powerfully down by means of a screw, so as readily to produce pressures of 500, 1,000, and even 5,000 and more pounds per square inch. The walls, being of extremely strong glass, give opportunity to observe the instruments of measurement enclosed. Experiments with this apparatus show that water at a depth of thirty-two feet exhibits a pressure of fifteen pounds to the square inch; at 100 feet, seventy-five pounds pressure; at 1,000 feet, 750 pounds; at one-half mile, 1,200 pounds; at one mile, 2,400 pounds; at two miles, 4,800 pounds; at three miles, 7,200. The pressure at any number of miles of depth may be ascertained by multiplying 2,400, the pressure at one mile in depth, by the number of miles given. For example, 2,400 multiplied by six equals 14,400, which represents the pressure at a depth of six miles.

When water is subjected to the pressure of 14,400 pounds (six tons,) to the square inch, (corresponding to six miles ocean depth) a bulk of 1,000 cubic inches is only reduced to 957 cubic inches, specific gravity 1.044, water at the surface being 1.000.

DO GREAT FIRES PRODUCE GALES AND WHIRLS?—There has been much said in the newspapers of the high wind which prevailed at the time of the Virginia City fire, and we have yet to learn whether the wind was blowing when the fire began or whether it was occasioned by the fire. It is generally supposed that the great Chicago fire broke out during the prevalence of a gale of wind, but such is not the fact. On Saturday preceding the fire there was a terrific gale blowing from the west, but it had spent its force before Sunday morning, and the afternoon and evening of that day a perfect calm prevailed. And it is a remarkable fact that, during the early hours of Monday morning, there was but little wind ten blocks west of the great path of fire through which a hurricane seemed to be sweeping. This statement can be verified by scores of witnesses who lived west of the river, and we have never had an explanation of the phenomenon. The fire itself created the wind which fed and fanned it, and drove it through the heart of the city with such appalling speed.

However much we may endeavor to comfort ourselves with the thought that a great fire in New York would not be exposed to such winds as came from off lake and prairie, it may nevertheless be true that a vacuum caused by large currents of ascending flames would, even here, produce just such another tornado as prevailed during the Chicago fire, before which New York's proud structures would turn to ashes. Indeed we see no reason why the lesson of Chicago may not yet be repeated in New York, and indeed there is none.—*American Artisan.*

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in the Mining and Scientific Press and other S. E. Journals.

ASSESSMENTS.—STOCKS ON THE LIST OF THE BOARDS.

Company.	Location.	No.	Amt. Levied.	Delinq't.	Sale.	Secretary.	Place of Business.
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FRIDAY, A. M., JAN. 7.		190	Seg Belcher	932/100	
380	West & Belcher	252/554	228	Yellow Jacket	100/955
430	Belcher	362/454	15	do.	b 30, 102
AFTERNOON SESSION.					
265	Bullion	56	100	Advance	61
930	Chollar	102/101	50	Am Flat	2/2
215	Con. Virginia	81/241	855	Am Hill	2/2
1165	California	81/241	1090	Alps	2/2
400	C Point	28	1450	Alta	2/2
80	Confidence	5	150	Belmont	2/2
540	Clendenia	26/33	400	Calaveras	2/2
502	Exchequer	16/16	454	Baltimore Con	3/2
75	do.	b 30, 92	3230	Geo Con	2/2
700	Gould & Curry	21/21	2580	Caladenia	27/40
535	Hale & Orr	552/454	50	Orange	2/2
285	Imperial	104	500	Dayton	2/2
120	Juanita	5	355	Eureka	15
10	do.	b 10, 92	480	Globe	1/2
135	Kentucky	17/4	70	Globe Ontario	12
185	Kentuck	14/14	200	Geo Thomas	3/2
100	Lebanan	21/21	1050	Gila	3/2
100	American	21/21	50	do.	b 10, 2
1850	Ophir	61/21	100	Hussey	2
1895	Overman	74/44	75	do.	2
1195	Savage	30	115	Jefferson	16/7
120	do.	b 10, 24	1060	Justice	33/22
1526	S Nevada	22/22	120	do.	b 10, 35
100	Succor	14/4	50	do.	b 10, 35
35	Seg Belcher	14/4	180	do.	b 10, 16
775	Union	10/10	130	do.	b 10, 15
400	do.	b 5, 10	450	Knicker	3/2
360	Yellow Jacket	115/101	450	Koseuth	3/2
20	do.	b 10, 11			
20	do.	b 10, 11			

AFTERNOON SESSION.

400 Adams B.	14 @ 1/2	275 Meadow Valley	2 1/2 @ 1/2
420 Alps	12 @ 1/2	110 Manfield	
50 Andrews	12 @ 1/2	550 Mint	52 @ 1/2
50 Andes	14 @ 1/2	550 New Conn.	2 @ 1/2
430 Anta	14 @ 1/2	1540 New York	2 @ 1/2
1530 Amazon	12 @ 1/2	2000 Newark	14 @ 1/2
430 Arden	12 @ 1/2	51 Nevada	1 @ 1/2
270 Belmont	12 @ 1/2	350 Occident	1 @ 1/2
430 Baltimore Con.	4 @ 3/4	120 Pico	1 1/2 @ 1/2
500 Cherry Creek	10 @ 1/2	120 Pbl Sheridan	5 @ 1/2
170 Clear Lake	2 1/2 @ 1/2	500 Pruesian	2 1/2 @ 1/2
60 Challenge		120 Punt	1 @ 1/2
50 Cosmopolitan	4 @ 1/2	490 Poorman	1 @ 1/2
235 Dayton	4 @ 1/2	100 Ray & Ely	19 @ 1/2
150 Dayton S.	1 @ 1/2	120 Ray	5 @ 1/2
535 Eureka Con.	15 @ 1/2	130 Rock	1 @ 1/2
500 Europa		3175 Rock Island	14 @ 1/2
1500 Genl. Charlar	1 1/2 @ 1/2	250 S. Chariot	1 @ 1/2
300 Genl. Thomae	1 1/2 @ 1/2	250 Succor	2 @ 1/2
100 "do."	5 @ 1/2	430 Union	10 @ 1/2
210 Genl. T. S.	1 @ 1/2	740 Union	15 @ 1/2
500 Huxey	5 1/2 @ 1/2	175 VanVale	1 @ 1/2
35 Jackson	2 @ 1/2		

250 Jefferson.....@1.75
30 Koseuth.....\$1.50

175	Knickerbocker	24% @ 24	155	Albany	24% @ 26
176	Walt Wash.	1% @ 3	155	Beet & Belcher	55% @ 68
177	do.	b 10, 3	55	Bullion	34% @ 24 1/2
179	Leviathan	1% @ 19 1/2	140	Obollar	16% @ 106
180	Leviathan Valley	1% @ 19 1/2	426	Can Virginia	440 @ 150
150	Mansfield	8% @ 26	129	do.	s 90
250	Mint	5% @ 92	123	G. do.	do.
1300	Mides	8% @ 94	2569	Caladonia	400 @ 1
210	Marietta	50%	454	Crown Point	27% @ 25 1/2
180	Marshall	50%	30	do.	b 5, 25
625	Monumental	1% @ 11 1/2	15	do.	b 20, 25 1/2
400	Newark	1% @ 15	25	Conbridge	do.
240	No Bole	30%	1350	California	5% @ 82
100	do.	40%	20	do.	b 5, 82
50	Niagara	30%	90	Empire Mill	b 30, 83
1350	N. Carson	65%	370	Eschequer	16% @ 15
200	North Can Virginia	1%	590	Gale & Curry	20% @ 4
150	do.	3% @ 20	370	Hale & Norcross	50% @ 55
150	New Oso	2% @ 24	250	Marial	50% @ 55
1415	New York	2% @ 24	745	Julia	16% @ 15
170	Occidental	3% @ 95	100	Justice	32% @ 33
650	High Hill	2% @ 27	140	Kearney	50% @ 55
100	Pike	2% @ 27	175	do.	b 10, 16
200	Prussian	2% @ 26	100	do.	32% @ 33
50	Prospect	1% @ 14	930	Lily Bryan	5% @ 12
1000	Panther	1% @ 14	100	do.	b 30, 55
250	do.	1% @ 14	465	Mexican	20% @ 21
190	Poorman	1% @ 14	835	Opfr.	50% @ 55
15	Rye Patch	1% @ 14	80	do.	50%
15	Rye & Elv.	19% @ 19 1/2	100	do.	s 10, 58
350	S. B. Land	4% @ 47 1/2	60	do.	b 36, 53 1/2
290	do.	b 30, 4	95	Overman	5% @ 17 1/2
100	Senator	1% @ 14	210	Savage	22% @ 21 1/2
55	S. Obiarot	10% @ 55	50	do.	b 5, 22
100	S. San California	2% @ 24	100	do.	b 5, 22
100	do.	b 30, 31	1520	Succor	120% @ 10
450	Utah Hill	8% @ 8 1/2	1285	Sierra Nevada	23% @ 25
140	Uval	18% @ 19	425	Union	10% @ 10 1/2
140	Goodville	3% @ 30 1/2			
750	W. Fargo	3% @ 30 1/2			
200	W. Belcher	3% @ 30 1/2			

SATURDAY, A. M., JAN. 8.

355 Alpha.	25/204	AFTERNOON SESSION.	
1016 Rest & Bel.	674	690 Ammon.	22/24
955 Belcher.	35/35	691 Alb. Hill.	22/24
1005 Bullion.	5	490 Am Flat.	24/24
393 Balt Con.	33/24	2220 Andes.	44/24
175 Chollar.	170/105	616 Alps.	25/20
20 China Point.	29/25	240 Advino.	5/20
120 do.	20/25	910 Alta.	44/25
250 Con Virginia.	44/67/41	515 Baltimore Con.	33/20
20 do.	5	555 Belmont.	17/22
100 Confidence.	22/22/23	3620 Coso Con.	21/22/21
1923 Con Virginia.	22/22	200 Challenge.	6/24
50 do.	5	200 C P R.	7/20
250 do.	5	650 Dewey.	6/24
110 Challenge.	34/24	50 Eldorado S.	3/24
100 do.	10	340 Enreka.	16/24/25
299 Empire.	34/24	509 Europa.	108/24
769 Exobaqueer.	16/24	25 Florida.	24
169 do.	5	850 Gila.	30/24
50 Florida Con.	16	300 Gm Thomas.	3
50 Globe & Curry.	22/22/12	375 Globe.	11/24
100 Globe.	22/22/12	140 Jefferson.	11/24/11
135 Hale & Nor.	55/55/55	70 Jackson.	30/24
140 Imperial.	10/24	593 Knightbooker.	4/25
1829 do.	10	690 Kosnott.	33/24/25
50 do.	10	810 Lady Wash.	33/24
160 do.	5	150 Levathian.	14/24/25
730 Julia.	17/24/24	150 Monumental.	11/24
110 do.	5	353 Midea.	8/24
305 Kentuck.	14/24/24	500 Mansfield.	5
295 Kolokor.	22/24/34	500 Maryland.	5/24
935 Meadow Valley.	22/24/24	500 Al Sierra.	5
185 Mon.	22/24	1193 Meadow Val.	5
50 do.	5	100 N Utah.	24
1010 Oppr.	61/24/26	200 N Con Va.	1
393 Overman.	74/24/24	2100 N Carson.	62/24/24
175 Ray City.	24/24	100 N Cort.	24/24
1626 Sage.	24/24	1550 New Cark.	24/24
959 Sierra Nevada.	22/24/24	100 Newark.	65/24/24
39 Sig Belcher.	22/24		
1626 Snowflake.	22/24		
1290 Union Con.	10/24/10		
39 do.	5		

100 Can.....	18	200 Niagara.....	50@550
MONDAY, A. M., JAN. 10.	1135	O G Hill.....	3@234

126	Alpa	23%	50	Occidental	61%	
1745	Best & Belcher	65%	65%	Phil Sheridan	75%	
150	do.	b 5	65%	250	Prospect	44%
160	do.	5	65%	260	Prospect	44%
180	do.	5	65%	270	Ranch	14%
133	Bullion	55/54	55%	775	Panther	14%
150	do.	55/54	55%	555	Prussian	55%
258	do.	b 50	102%	675	Foreman	81%
50	do.	b 10	102%	675	Foreman	81%
325	Confidence	21/20	20%	855	Rt & Elv	19%
100	do.	21/20	20%	85	do.	53%
100	do.	b 30	450	50	South Carolot	we
3080	California	79/30	30%	2425	Silver Hill	100%
515	Corn Point	21/20	20%	32	Stuberland	35%
50	Empire Mill	3/20	20%	200	St Patrick	35%
50	do.	b 5	6	200	St Patrick	35%
130	do.	b 5	6	300	Wells	174%
55	do.	b 5	6	600	Wells	59%
535	Gould & Curry	20/20	20%	1690	Wells-Pargo	20%
175	Hale & Nor	54/51	51%	10	W B Belch	20%
200	Imperial	14/20	20%	WEDNESDAY, A. M., JAN. 12.		
290	Kentuck	54/51	51%	39	Alpa	26%
495	Mexican	20/20	20%	100	do.	63%
100	do.	b 5	20%	100	do.	63%
100	Oper Nevada	55/54	54%	200	do.	63%
20	do.	b 5	58%	100	do.	63%
100	Overman	74/47	47%	100	do.	63%
100	do.	74/47	47%	12	Belcher	55%
1275	Savage	22/21	21%	270	Bullion	55/54
70	do.	b 5	21%			

90	do	5	5	460	101 El Dorado South	
91	do	5	5	460	404 Eureka Con	15 @15
92	do	5	5	460	100 Gen Thomas	4 @4
93	do	5	5	460	100 Gen Thomas	4 @4
94	Confidence	23	23	323	1385 G Charlot	1 @1
95	Caledonia	40	40	153	800 Globe	1 @1
96	Empire Mill	50	50	234	500 Hudson	1 @1
97	Essex	50	50	234	500 Hudson	1 @1
98	do	50	50	163	250 Jackson	2 @2
99	Gould & Curry	22	22	31	323 Knickerbocker	1 @1
100	Hale & Nor	50	50	40	500 Kossuth	3 @3
101	do	50	50	40	500 Kossuth	3 @3
102	Justice	32	32	32	800 Leopard	1 @1
103	do	5	5	32	735 L Wash	3 @3
104	Julia	163	163	25	50 Mansfield	
105	do	163	163	25	50 Mansfield	
106	do	163	163	25	50 Mansfield	
107	Lady Bryan	45	45	26	500 Mint	6 @6
108	Mexican	21	21	61	100 Newark	15 @15
109	Opbir	50	50	61	625 New York	
110	Orlean	50	50	61	625 New York	
111	Savage	22	22	32	150 N Bell	3 @3
112	do	50	50	238	800 Occidental	1 @1
113	Seig Felcher	110	110	250	500 Org G Hill	2 @2
114	St Louis Nevada	25	25	30	500 Sherman	87 @87
115	Sugar	15	15	62	300 Truman	1 @1
116	Union	110	110	150	1450 Panther	1 @1
117	Yellow Jacket	112	112	315	60 Pioche	
					1000 Phil Sheridan	1 @1
					423 Ruby	15 @15
AFTERNOON SESSION.						
100	Andes	45	45	300	800 R Island	4 @4
101	Alts	45	45	300	800 R Island	4 @4
102	Adams Hill	16	16	24	200 S Obu	5 @5
103	Am Flat	2	2	145	800 R Island	
104	Am Flat	2	2	145	800 R Island	13 @13
105	Advance	6	6	100	50 St Patrick	3 @3
106	Alps	2	2	63	100 Utah	17 @17

Belmont.....	2 2/4	605 Woodville.....	3 1/2
Condor.....	62 1/2 c		

SALES OF LAST WEEK AND THIS COMPARED.

THURSDAY A. M., JAN. 6		THURSDAY A. M., JAN. 13	
5 Alpha	25 @ 26 1/2	125 Alpha	25 1/2 @ 26 1/2
5 Ailsa	25 @ 26 1/2	135 Best & Bel.	25 1/2 @ 26 1/2
5 Belcher	25 @ 26 1/2	140 Best & Bel.	25 1/2 @ 26 1/2
5 Best & Belcher	25 @ 26 1/2	150 do.	25 @ 26 1/2
5 do.	25 @ 26 1/2	400 Belcher	25 1/2 @ 26 1/2
5 do.	25 @ 26 1/2	145 Bullion	25 1/2 @ 26 1/2
5 Bullion	25 @ 26 1/2	50 do.	25 @ 26 1/2
5 Confidence	25 @ 26 1/2	110 Crown Point	25 1/2 @ 26 1/2
5 Caledonia	25 1/2 @ 26 1/2	210 do.	25 1/2 @ 26 1/2
5 Crown Point	25 @ 26 1/2	240 Con Virginia	25 1/2 @ 26 1/2
5 Con Virginia	25 1/2 @ 26 1/2	50 do.	25 @ 26 1/2
5 California	25 1/2 @ 26 1/2	50 do.	25 @ 26 1/2
5 Empire Mill	25 1/2 @ 26 1/2	50 California	25 1/2 @ 26 1/2
5 Exchequer	25 1/2 @ 26 1/2	205 Confidence	25 1/2 @ 26 1/2
5 do.	25 @ 26 1/2	470 Empire M.	25 1/2 @ 26 1/2
5 G & Curry	25 1/2 @ 26 1/2	50 do.	25 @ 26 1/2
5 do.	25 @ 26 1/2	530 Gould & Curry	25 1/2 @ 26 1/2
		530 Halo & Norcross	25 1/2 @ 26 1/2

5	Hale & Nor.	59@57 1/2	1985 Justice	27 1/4@28
10	do	h 10 68 1/2	1980	h 5 87 1/2

0	Imperial	104@100	165	Kentucky	5 542@100
0	do	b 15 105	50	Mexican	2 20@100
0	Julia	184@180	115	Ophir	394@100
0	do	b 5 185	175	Overman	2 160@100
0	do	b 5 185	345	Savage	238@100
0	Kentucky	14 21@100	200	Sierra Nevada	2 27@100
0	Lady Bryan	6 65@5	20	do	b 30 210
0	do	b 30 60	75	See Belcher	102@100
0	do	28 34@100	50	Yellow Jacket	170@100
0	Ophir	30 30@100	20	do	s 5 106
0	do	b 5 63@100			
0	Overman	17 74@2		AFTERNOON SESSION.	
0	Sierra Nevada	23 21@15	14	See Hill	14 14@100
0	Savage	20 22@100	30	Alpa	2 20@100
0	do	b 5 23	20	Advance	6 65@5
0	do	b 30 23	140	Amazon	2 22@2
0	do	b 30 23	40	Belmont	2 25@2
0	See Belcher	8 85@5	80	do	2 25@2
0	do	10 10@100	80	Coso Con	2 25@2
0	Union	10 10@100	70	Caledonia	4 40@3
0	do	b 30 104	15	Cosmoopolitan	37 40@100
0	do	b 5 104	30	Challenge	25 40@100

615 Enreka Con	.....15@14%
100 Europa	.....15@14%

Adams Hill	161	70	Elphinst.	
Advance	53	173	Gila	3
An Flat	100	0	Golden Cb.	5
Belmont	404	1	Globe	1
Baltmore Con.	33	140	Globe	1
Cherry Creek	1	2125	Hussey	150
Chesapeake	2	1	Knickerbocker	307
Challenge	6	135	Jefferson	13
Dayton	43	800	Julia	16
Eureka Con.	16	275	Knickerbocker	307
Excelsior	27	2125	Golden Cb.	5
G. Charlot.	2	213	Leviathan	1
Gloucester	2	100	Lady Bryan	34
Hobbes	1	65	Madow Valley	24
Jack	1	100	Maid	1
Jefferson	7	1000	do	3
Knicker	2	38	Mides	3

0 Leopard.....	11 3/4 @ 1 1/2	100	M Self.....	5
0 Meadow Valley...	2 1/2 @ 2 3/8	1225	Monumental.....	1 1/4 @ 1 1/2
0 Mansfield.....	2 1/2 @ 2 3/8	60	Northern Belle.....	2 1/2 @ 2 3/8

0	Min.	152	100	1200	North Carson.	110	0
0	N York.	21	2214	15	Niagara.	906	0
0	Occidental.	43	406	90	Ntb Con,Virgna.	110	1
0	Raymond & Ely	18	191	100	Norman	1	0
0	Egg Patch.	1	1	1	do.	1	0
0	Rock Island.	134	145	10	do.	b5	1
0	St Patrick.	3	32	15	Picoba.	2	0
0	Ss Charlot.	1	101	100	Prussian.	14	0
0	St Hill.	1	1	30	Quincy.	15	1
0	Utah.	19	191	70	Prospect.	1	0
0	Woodville.	3	203	135	Ray & Ely.	20	19
0				1970	Rock Island.	4	0
0				200	South Carol.	20	0
0				280	Sourb Cal.	2	0
0				800	Sutherland.	20	0
0				2945	S Hill.	0	1
0				3175	Succor.	11	0
0				376	Union Cal.	1	0
0				50	do.	b3	11
0				355	Utah.	19	19
0				100	do.	b	20
0				200	Wells Fargo.	1	0
0				900	West Relat.	1	0

The Mining Share Market.

The mining share market during the past week has manifested no very marked peculiarities, prices having fluctuated very little. No important rise is expected as yet, and the general opinion is that prices will be lower before they are higher; of this, however, no one can make any reliable predictions. The Stock Exchanges held their annual elections this week, the result of which will be found in another column. Concerning "investigations" of mining companies very little has been accomplished as yet. The Gila investigation amounted to little—the old board of trustees having been re-elected. The Woodville company, at a meeting held on the 6th inst., appointed J. J. Green, Charles E. Harris, W. C. Nesl, W. S. Barrett and J. V. Sims, stockholders of the company, a committee of five to examine in behalf of the stockholders into its affairs, and they were authorized to receive and examine all books, vouchers and accounts of the company and the affairs thereof, and also to examine into the conduct and management of its present and past officers, and report the same to an adjourned meeting of the stockholders, to be held on Wednesday. The meeting, which was to have been held on Wednesday, was postponed at the request of the company.

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Albama Quicksilver M Co	Cal	2	5	Dec 15	Jan 20	Feb 13	A L Fuller	323 San Jose st
Alameda Nevada M Co	Washeo	1	10	Dec 4	Jan 10	Feb 2	L Herman	420 Pine st
Black Hawk C'al M Co	Cal	5	5	Oct 25	Dec 24	Jan 15	H A Powell	520 Montgomery st
Brooke S M Co	Washeo	Cal	25	Dec 10	Jan 13	Jan 31	I T Milliken	380 Montgomery st
Cerokee Flat Rine Gravel Co	Cal	35	1	5 Dec 23	Jan 25	Feb 13	O H Bogart	328 Montgomery et
Chico M Co	Washeo	Cal	25	10	Jan 10	Feb 13	Mar 3	419 3rd St
Dardanelles M Co	Washeo	3	100	Jan 12	Feb 14	Mar 2	W S Duval	402 Montgomery st
Dexter S M Co	Washeo	1	20	Dec 20	Jan 24	Feb 12	W F Borart	402 Montgomery st
Edib Quicksilver M Co	Cal	6	15	Nov 24	Jan 3	Jan 20	W Stuart	115 Leidesdorff st
El Dorado Water & Gravel Co	Cal	2	00	Jan 31	Feb 13	Feb 29	J H Adams	47 Montgomery st
Electric M Co	Butte Co	7	3	Nov 23	Jan 3	Jan 22	A S Paul	318 California st
Enterprise Cone M Co	Cal	6	15	Dec 30	Feb 7	Feb 29	F J Hermann	418 Kearny st
Equitable Tunnel & M Co	Utah	11	20	Nov 12	Jan 3	Jan 22	O S Healy	Merchants' Ex
Excelsior M Co	Cal	2	2	Nov 20	Jan 24	Feb 7	J H Adams	418 Kearny st
Green G M Co	Nev	13	5	00	Jan 3	Feb 24	S Phillips	46 California st
Howard Hill M Co	Grass Valley Cal	5	5	Nov 25	Jan 5	Jan 27	F J Hermann	418 Kearny st
Knickbocker M Co	Washeo	14	100	Dec 28	Jan 29	Feb 18	Chas A Morse	Stevensons Bldg
Los Prietos M Co	Cal	3	00	Nov 12	Dec 3	Jan 13	S H Smith	84 Montgomery Av
Madison & S M Co	Cal	3	100	Nov 29	Dec 11	Dec 1	J B Jennings	309 California st
Mint G & S M Co	Washeo	12	20	Jan 6	Feb 8	Mar 1	D A Jennings	401 California st
North Carson S M Co	Nev	3	10	Dec 16	Jan 20	Feb 12	W A Van Bokkelen	323 Sansome st
Oakland Quicksilver M Co	Cal	1	50	Oct 11	Jan 13	Jan 31	W W Traylor	Nevada Block
Onyx Tunnel M Co	Cal	8	2	Dec 2	Jan 13	Jan 24	D Wiler	Merchants Bldg
Owyhee Water & Gravel Co	Nev	1	30	Nov 1	Dec 15	Jan 15	J E McDonald	405 California st
Poncasotas G M Co	Cal	12	25	Dec 14	Jan 18	Feb 8	O C Eaton	Express Bldg
Red Jacket M Co	Idaho	8	25	Dec 16	Jan 20	Feb 5	W Willis	Nevada Block
San Rafael M Co	Washeo	1	10	Dec 16	Jan 17	Feb 13	J B Jennings	403 California st
San Francisco Copper M Co	Cal	3	8	Dec 10	Jan 15	Feb 15	R de Clairmont	Cor Front & Jackson
San Jose M Co	Nev	10	500	Dec 10	Jan 17	Feb 19	A Carrigan	109 Front et
Silver West Cone M Co	Eureka	5	1	Dec 7	Jan 20	Feb 29	F R Banker	606 Montgomery st
Taylor M Co	Cal	2	10	Dec 10	Jan 12	Feb 3	S M Montgomery	407 Montgomery st
Valley Copper M Co	Cal	20	20	Dec 10	Jan 12	Feb 3	W H Martin	323 Montgomery st
Woodside M & M Co	Cal	3	25	Nov 24	Jan 4	Jan 24	J Glassman	335 Montgomery st
Young America M Co	Nev	2	30	Dec 23	Jan 27	Feb 16	R H Brown	402 California st
Zacatero G M Co	Calaveras Co	7	20	Dec 16	Jan 26	Feb 16	Wm Macdonald	311 California st

MEETINGS TO BE HELD.

Name of Co.	Location.	Secretary.	Office in S. F.	Meeting.	Date.
Belcher M Co	Madison	H C Kibbe	419 California st	Annual	Jan 25
Bonanza M Co	Utah	F Wadge	Merchants' Ex	Annual	Jan 25
Bellinshaw Bay Coal Co	Oregon	J H Dobinson	335 Sansome st	Annual	Jan 15
Black Diamond Coal M Co	Cal	J H Dobinson	305 Sansome st	Annual	Jan 15
California Minnie Co	Washeo	O P Gordon	27 Nevada Block	Annual	Jan 19
Fort Point Extension M Co	Nov	G R Spinnery	320 California st	Annual	Jan 25
Central Belmont M Co	Nov	D Wilder	Merchants' Ex	Annual	Jan 24
Globe Cons M Co	Nov	Called by Trustees	419 California st	Special	Feb 3
Jefferson S M Co	Nov	C A Sankey	331 Montgomery st	Annual	Jan 27
Jacob Little Cons M Co	Nov	W R Townsend	320 Pine st	Annual	Jan 23
Kanawd M Co	Nov	Called by Trustees	210 California st	Special	Feb 4
Kosuth M Co	Nov	E F Stone	419 California st	Annual	Jan 17
Lower Comstock M Co	Nov	W R Townsend	330 Pine st	Annual	Jan 26
Kalokerbecker M Co	Nov	Olus A Morse	Stevenson's Bldg	Annual	Jan 21
Nevada Quicksilver M Co	Nov	L M Morgan	217 Sansome st	Annual	Jan 19
Monona & M Co	Nov	Called by Trustees	215 Sansome st	Special	Feb 1
Raymond & Elly M Co	Nov	T W Colburn	418 California st	Annual	Jan 25
South Mountain Cons M Co	Idaho	W Willie	Nevada Block	Special	Jan 26
San Marcial S M Co	Mexico	Sampson Tams	210 Front st	Annual	Jan 22
Sierra Nevada M Co	Washeo	W W Stetson	Nevada Block	Annual	Jan 18
Silver Central Cons M Co	Nov	L Hermann	330 Pine st	Annual	Jan 17

LATEST DIVIDENDS (within three months)—MINING INCORPORATIONS.

Name of Co.	Location.	Secretary.	Office in S. F.	Amount.	Payable.
Belcher M Co	Washee	H O Kibbe	419 California st	1 00	Jan 10
Black Bear Quartz	Cal	W L Oliver		25	Sept 13
Cons Virginia M Co	Washee	Chas H Fish	401 California st	10 00	Jan 11
Empire M Co	Nevada	D A Jennings	401 California st	50	Sept 13
Indian Queen M & M Co		A K Durbrow		10	Dec 31
Northern Belle M & M Co		W Willie	419 California st	1 00	Jan 15
West Comstock G & S M Co	Washee	Oliver G Wood	584 California st	50	Jan 24

mittee appointed at the last meeting to investigate the affairs of the company, and who are not yet ready to report. Due notice will be given when the meeting will be held.

Stockholders of Globe Consolidated are notified that on the 3d of February the question of increasing the capital stock of the company from \$4,000,000 to \$10,000,000 in \$100 shares, will be submitted to them for ratification or rejection. South Comstock stock has been increased from \$3,800,000 to \$10,000,000.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

California.

AMADOR.

The directors of the South Mountain Consolidated mining company have called a meeting of stockholders for the 26th of this month for the purpose of considering the condition of the affairs of said company, and determining upon the propriety of winding up its affairs and making application to the U. S. district court to have the company adjudged bankrupt; also that such proceeding be had therein as provided by the laws of the United States respecting bankruptcy.

Consolidated Virginia has declared its usual monthly dividend of \$10 per share, aggregating \$1,080,000.

Crown Point has levied an assessment of \$1.

The Northern Belle mining company, has declared its eighth consecutive dividend of one dollar per share, aggregating \$50,000, payable on the 15th inst. The hullion product of the Northern Belle mine for December was \$103,000, of which \$24,000 was produced during the last week of the month from 300 tons of ore.

Fire and water have both become elements of mischief, and it will be a fortunate circumstance indeed if the property comes out of the ordeal without serious loss. The people of Sinter Creek feel the effects of the stoppage of work upon the mine, but bravely hope for the best.

KENNEDY MINE.—Work on this mine has been totally suspended. The pumping operations ceased last week, the stock of wood being exhausted, and the roads being in too bad a condition to admit of hauling. We understand it is the determination to suspend mining for

The Ophir mining company has constructed a novel railway to transport timber and lumber from the Virginia and Truckee railroad to their carpenter shop, being laid with rails two inches wide, and with a decent of one foot in thirty. These rails are greased, and the timber placed crosswise upon them travels rapidly to its destination.

A PEAT fuel company has been organized at San Jose with a capital of \$1,500,000, to operate in the peat beds in the San Joaquin valley tule lands.

company, of Cherokee, were employing Chinamen and dispensing with white labor, and at the same time expressed the hope that the report was incorrect. We are glad to know that the report was incorrect, and that the Cherokee will not employ Chinese to the exclusion of white labor. While other companies of importance in the State have employed "Chinese cheap labor" to work their mines as a means of increasing their dividends, the Cherokee company have not employed them to the exclusion of white labor, and we are assured that they do not intend doing so. The report probably grew out of the fact that this company had allowed a gang of Chinamen to work on bottom cement, where it did not pay white labor. They first leased the ground to white laborers at one-half the product. They realized \$1.70 per day to the man for the month, and then gave it up. It was then given to Chinamen on the same terms, who worked it for awhile, and have since worked on the same class of ground another gang of Chinamen at \$1.25 per day. This is entirely independent of their regular force of miners at work in their claim, and is ground that white laborers do not care to work. The company is employing about one-third more white laborers at the present time than at any period heretofore. They have recently let several tunnel contracts, which were prosecuted with Chinese labor; but the company had nothing to do with the matter after letting the contract. We are aware that the Spring Valley company could operate their claim much cheaper by the employment of Chinese labor than they have heretofore and now do by white labor, and we are glad to be able to record the fact that the company remains true to its principles, and will continue to employ white laborers so long as their mines confine to yield and laborers desire employment. Their liberality in this respect is worthy of imitation by other companies.

CALAVERAS.

WEST POINT DISTRICT.—Calaveras Chronicle, Jan. 8: M. D. Baker, superintendent of the Chesno, accidentally hurt his left hand badly while adjusting the hoisting machinery. The lower south level is still running in bonanza, showing in face forty inches of fair ore, which contains principally sulphurets of iron; also free gold. The south pay chute in this level is now over 40 feet in length. Main shaft of Mina Rica 293 feet deep and sinking. Fissure in bottom of shaft is five feet; handsome walls, especially the foot wall. Ore in bottom shows gold freely. A detached, very rich streak is making on the hanging wall. All the dikes which have been met with in the workings above have now disappeared (generally, dikes cut lodes at right angles in this district). The lower levels are being extended rapidly, as the veinstone and country rock are easier mined than above. A recent partial clean-up at the mill indicates excellent results. Amalgam retorted \$7 per ounce.

GLENCOE DISTRICT.—The Grasshopper is under headway. A large number of the principal mines are in need of building and mine materials which cannot be had, excepting in small quantities, on account of bottomless roads. The reopening of the Wolverine has been postponed until the beginning of fair weather.

LATER.—Ore worth \$150 per ton was struck in the south level of the Chesno this (Wednesday) evening. The rich ore is fully two feet thick and swelling. Full width of ore body 40 inches.

LOS ANGELES.

MINING INTERESTS.—Los Angeles Herald, Jan. 2: The mining interest has not hitherto been of much consequence, though in this county gold was first discovered in 1833. In San Gabriel canon, 18 miles from Los Angeles, is a silver bearing lode, owned by Dr. Winston, called the Zapatin mine, which promises to be very valuable, and copper, quicksilver and tin have been discovered in paying quantities in several localities. Oil has been struck in several places, and coal and marble have been discovered of good quality, though not in great abundance.

NEVADA.

PROSPECT.—Grass Valley Union, Jan. 8: The Prospect mining company is one of our local arrangements. The stockholders are working miners mostly, with a few merchants and business men coming in now and then. The trustees levy small assessments from time to time, and the money thereby raised is used for prospecting some ledge in this district. The affairs of the company are managed in the most economical way. Of late the Prospect company's workers have been prospecting the Perseverance ledge, which is located between Allison ranch and Forest springs. Last Thursday they took up some of that Perseverance ledge. The ledge is fully three feet thick and shows well in free gold and good sulphurets. The rock by mill process, according to the opinion of good judges, will yield from \$50 to \$60 to the ton. We are glad that the brave Prospect company have something good in sight. The showing is indeed most excellent. The Allison Ranch Franklin mine will soon begin work. The claims of the company are north of and adjoining the celebrated old Allison Ranch mine. A company has been organized and incorporated, with headquarters at San Francisco, and ample funds have been secured for the purpose of developing the mine. In a short time hoisting and pumping machinery will be on the ground and set up. The reducing machinery will probably not be put up until next summer, when the Fryer process can be used.

We are promised some items of interest in the history of the Allison Ranch Franklin.

PLACER.

MINING ITEMS.—Dutch Flat Forum, Jan. 6: The rain which set in on the 23d of last month, and still continues, has caused the contentment of our miners to brighten up with a gleam of indescribable satisfaction.

The storms which we had the latter part of November and early part of December were all rain and did not deposit any snow on the mountains. The present storm, however, has deposited quite a large body, so that we have now the assurance of a good water season.

The various mines in this district are being worked with vigor. The owners of these which were ready at the commencement of the November rains consider that they have at least one month's start in advance of an average season.

The Yankee claim was cleaned up a few days ago with very satisfactory results. This claim has thus far this season been washing days only; it will hereafter be run days and nights. The powder drifts heretofore mentioned were completed, and yesterday the blast, consisting of three hundred and fifteen kegs of powder, was exploded, doing splendid execution, loosening an immense amount of gravel, sufficient, it is supposed, to keep the 1,200 inches of water forced through the two immense giants at work for at least twenty days and nights.

The Central, Jehosphat, Pacific, Comet, Lekamp, Elmore Hill, Hoskin, Gold Run, North Star, Cedar, and Judd claims are all washing.

YANKEE TUNNEL.—The bed rock tunnel under the Yankee claim has reached a point opposite the Badger shaft, and the drillers have gone back fifty feet and started a branch leading to the bottom of the shaft, through which the Badger claim will soon commence washing.

This Badger claim above referred to is supplied with a hundred foot water power derrick, with an eighty-six foot boom, and everything necessary for advantageous working. The pipe is in position, and as soon as the connections with the shaft are made, the sluices will be placed in the tunnel, when this claim will be ready to step forward as one of our gold producers.

The tunnels of the Buckeye, Franklin, and Boston claims are completed, and sluices are being placed therein. All three of these claims will soon be washing and be productive, much to the satisfaction of the owners, no doubt, as heretofore the amount paid out in running these tunnels has been quite a drain on the aforesaid companies.

THE ORATEA MINE.—Placer Herald, Jan. 6: News from the Oratea mine continues very encouraging. The new hoisting works are completed, and the engines, pumps, etc. ready to move. The main shaft has been newly timbered down to the 360-ft level, at which depth the oars are now running. Though the mill is kept steadily running, the pile of ore on the dump remains large, and the rock of a character highly satisfactory. In every respect the future of this mine looks very bright. During the month of December the mill, in twenty-seven running days, crushed five hundred and forty tons of rock, which yielded eight hundred and ninety-six and a half ounces of gold. John A. Townsend, the efficient superintendent, can well review the results of his efforts on this mine during the year just past, with pride, for from his management the new year promises to prove one of success for the company.

SAN BENITO.

SILVER PROSPECTS.—San Benito Advance, Jan. 8: The Mechanics' Strike is the name of the silver bearing ledge owned by Charles Sairs, Farrell and others, and located about twelve miles east of Hollister. The working force have sunk a shaft down about twenty feet, and by penetrating into the hillsides about eight feet through the drift they have struck a vein of promising ore. Several tons are now on the dump. A sample has been shipped to Grass Valley to be worked by the Fryer process. Large quantities of sulphur and arsenic have been found in the vicinity of the mine, combined with other mineral.

Nevada.

WASHOE DISTRICT.

CONSOLIDATED VIRGINIA.—Gold Hill News, Jan. 6: Daily yield 600 tons of ore, keeping the mills all running up to their full working capacity. Contrary to general expectation, the Consolidated Virginia mining company yesterday declared a dividend of \$10 per share on their capital stock, aggregating \$1,080,000, and payable on the 11th inst., thus, in the face of floods, fire and storms, continuing steadily to pour out its millions of treasure—strengthening, building up and sustaining, not only its own elevated character, but aiding, by its treasures and the encouragement it gives, the development of every other mine on this line of the Comstock.

OPHIR.—The repairs to the drifts and winzes on the lower levels are steadily advancing, and are progressing so favorably that the hoisting of ore will probably be resumed in about another week's time. The pumps and pumping machinery are working splendidly.

BELCHER.—Daily yield 450 tons of ore, all of which is being crushed by the mills as fast as it is extracted. The returns from the ore are good and the prospects are that the monthly yield will be increased instead of diminished. A dividend of \$1 per share, aggregating \$104,000, was declared on the 3d inst., with every

prospect of not only a continuance of the dividend, but a fair expectation of an increase in the amount.

NORTH CONSOLIDATED VIRGINIA.—This mine is attracting more than usual attention, from its location being on the direct course or tend of the immense ore deposits in the Consolidated Virginia, California and Ophir, and being situated only about 1000 ft to the north and east of the Ophir. In addition to this the shaft has reached a depth of 630 ft, at which point the management have determined to start their first drift to cut and prospect their ledges. The belief in the minds of many is strong that they will find a continuation of the rich ores of the Ophir still further to the northeast than it has yet been developed. The ravines in the vicinity of the North Consolidated Virginia shaft have been worked at intervals for years past for the gold they contained, and there is a prevalent and well founded belief that the source of this gold cannot be very far away. The machinery of the mine is in excellent working condition, and the developments are being pressed ahead with all the vigor possible.

JULIA CONS.—The main south drift on the 1400-ft level is steadily advancing, the face in low grade ore. Opening the 1600-ft station and drifts is making rapid headway, many fine seams of quartz and ore being encountered, while outting for the station. This work is being done in the best possible manner, none but the best of timbers being used in the construction of the station.

CHOLLAR-POTOSI.—Daily yield 70 tons of ore. The bullion shipments for the month of December amounted to about \$50,000. There is no material change in any of the ore producing sections of the mine.

SULLIVAN.—The station at the adit level, beneath the bottom of the shaft, being completed, a drift is now being run south from it, following a very eligible strata in the ledge matter. As several small veins of pay ore were passed through by the tunnel, it is expected that this south drift will develop a body of ore somewhere at this level. The prospects for finding a bonanza were never better in any mine on the Comstock than in this. After running about 300 feet south, following the vein, cross-cuts both east and west will be made, exploring the ledge from wall to wall, 180 feet.

KOSKUTH.—The winze 600 feet south of the main shaft is down 100 feet below the 200-ft level, the bottom having struck a flow of water so strong as to stop and prevent a continuance of the work until the water is drained by the main south drift on the 350-ft level. Pumps continue to handle the water with the most perfect ease, and everything in and about the mine works splendidly.

LEVIATHAN.—Sinking the main shaft deeper is being done at a lively rate. Some very promising veins of ore are now being passed through in sinking, all of which give good assays, being evidently feeders of the main ledge. In sinking this shaft deeper it is expected to cut the main ore vein developed at the 420-ft level, at the depth of 550 or 600 feet in case it preserves its regular pitch or dip to the eastward, which it doubtless does.

GLOBE CONSOLIDATED.—The prospecting drifts both north and south on the 350-ft level are steadily advancing with very encouraging results. When once the contemplated new pumping machinery is erected and in good working order the prospects of the Globe will be second to none of the prospecting claims on that portion of the Comstock.

OVERMAN.—The main west drift on the 1100-ft level has reached the east wall of the ledge, and will, in a day or so more, connect with the north drift from the bottom of the winze on the same level. As soon as this connection is made and ventilation obtained, cross-cutting the 1100-ft level will be commenced.

LADY WASHINGTON.—Owing to an accident to one of the hoisting reels work has been somewhat retarded, but the damage has been repaired and work resumed.

BALTIMORE AND AMERICAN FLAT.—The excavation for the large water tanks at the 1050-ft station is completed, and the putting in of the tanks is getting well under way. The machinery of the mine is in the finest possible working condition.

ORIGINAL GOLD HILL.—The south ore body shows improvement, not only in extent, but also in richer ore. The extraction continues at the rate of twenty tons per day, which is reduced at the Hope mill, Silver City. The first shipment of bullion to San Francisco from this mine last Saturday amounted to \$3,145, and the next regular shipment will be made Saturday. When increased milling facilities can be secured a corresponding increase in the bullion will follow, as there is any amount of ore in sight.

BULLION.—The north drift on the 1700-ft level is steadily advancing in very favorable ledge matter. Sinking the main incline is going rapidly ahead, the bottom in good working ground.

CALIFORNIA.—Sinking the C. & C. shaft is making excellent progress, the bottom in good sinking ground. There is but little being done in the way of developments on the lower levels, if we except a continuation of the north drift on the 1550-ft level toward the Ophir line. The face of this drift is still in good ore.

YELLOW JACKET.—The north and south drifts from the bottom of the winzes on the 1940-ft levels have been connected, and the men are now engaged in timbering the drifts. As soon as the timbering of the drifts is completed, cross-cutting on that level will be commenced.

CROWN POINT.—Daily yield 425 tons of ore, keeping the mills all steadily running. The

ore breasts show no encouraging features for the week, but continue much the same as for several months past. The prospecting drift south on the 1600-ft level is steadily advancing to connect with this winze from the level above. Sinking this winze is steadily going forward, the bottom in ore of a fine character.

LADY BRYAN.—The main north and south drifts on this 380-ft level are being steadily advanced, both affording more favorable prospects than for some time past. On this 250-ft level the south drift is showing some good ore.

NEW YORK CONSOLIDATED.—Raising the third compartment of the shaft is making excellent progress. The 800-ft level is well opened, and two drifts have been started, one east and the other west, to cut and prospect the ore vein. The face of both these drifts are in fine ledge matter.

DAYTON.—Two drifts, one north and other south, have been started on the 500-ft level.

NORTH OAKSON.—The air shaft connection being completed, good ventilation is secured, and the work is being pushed forward to better advantage than ever. The ore in the face of the north drift shows considerable improvement, the vein increasing in width and showing more black sulphurets and less of the copper stain heretofore met with. Sinking is resumed in the main shaft.

IMPERIAL-EMPIRE.—Daily yield 40 tons of ore. There is little if any change in the appearance of the ore, either north or south during the week. The north drift on the 2000-ft level is still in fine quartz, carrying apots and streaks of excellent ore.

SILVER CITY.—Work in this mine going ahead vigorously as usual. The ore is being stopped out above the main adit level and deposited at the dump for milling. A large amount of ore has accumulated on the dump, and the milling of it will be commenced soon. The working of the mine has been very systematically and effectively conducted under the present management.

JUSTICE.—At the 800-ft level the drift south shows well in low grade ore in its face. The stopes and breasts of the 400 and 600-ft levels are yielding about thirty-five tons per day of good paying ore.

SUTRO TUNNEL.—Some very fine stringers or feeders of quartz, or low grade ore, have been cut through during the week, giving assays from \$1 to \$7.25 per ton. The Burlington drills are doing splendid work, and the tunnel advancing at very fair rate. Total length last evening, 11,846 feet.

HALE & NORCOR.—Owing to a breakage of the pump-rod during the latter part of last week, but little work has been done on the lower levels of the mine. The damages are again repaired, and sinking the winzes on the 2200-ft level is again going steadily forward.

LEO.—The north drift at the bottom of the winze is still in quartz and ore of a very encouraging character.

COSMOPOLITAN.—Some bunches of ore, showing well in free gold, were met with in the north drift during the week.

PICTOU.—More streaks of quartz have been passed through this week, and the general appearance of the material in the face of the tunnel indicates still nearer proximity to the ledge.

KNICKAROOKER.—The flow of water is being gradually lessened by the pumps.

GOULD & CURRY.—Retimbering the shaft is going on steadily ahead; it is expected it will be completed in a few days more.

Colorado.

SPLENDID CHUNK.—Colorado Miner, Jan. 1: Mr. Edward Riley, the superintendent of the Stevens mine, recently took out a chunk of ore weighing 277 pounds, which has been forwarded to General Beverley R. Keim, of the Kansas Pacific railway, for exhibition at the Centennial. It runs 96 ounces in silver to the ton, and 73½ per cent. lead. We hope our miners generally will follow this example.

BOULDER COUNTY.—The Banner says that Messrs. Carvell have started crushing and amalgamating works four miles up Boulder canon. From the Banner's description we presume these works treat only nonrefractory surface ores.

New shaft houses are dotting the hillsides. Miners are all happy in the possession of winter jobs. The American mine building is completed. Mining property is lively.

The discovery of a valuable deposit of mica, three miles north of Sunshine, is reported. An eight-foot shaft reveals a four-foot vein.

Idaho.

REVIVAL OF BUSINESS.—Idaho Avalanche, Jan. 7: That there will be a general revival of business in connection with mining operations in this vicinity at an early day, there is now no doubt. Fairview, Wagonwain, South Mountain, Flint and other camps will present a lively appearance in a few months hence. Posey & Co. keep seven teams engaged in hauling rock from the Oro Fino, South Chariot and Belle Peck mines. The roads are in good condition. There is a great disappointment among the former employees of the Empire at the non-resumption of operations in that mine. Many of them would be quite willing to begin work and take their chances of getting pay from the rock that would be crushed, which is known to be quite rich. There will be another cleaning up from Belle Peck rock in a week or two, and a handsome yield is promised. Vigorous operations have been started at the Golden Chariot since the first of the year.

WOODWARD'S GARDENS embraces an Aquarium, Museum, Art Gallery, Conservatories, Tropical Houses, Menagerie, Seal Ponds and Skating Rink.

Quicksilver in San Luis Obispo County.

The San Luis Obispo Tribune says: Mining for quicksilver is becoming one of the leading industries of San Luis Obispo county. At the present rate of development it will not be long until the mines of this county will equal in production, if not surpass, that of any locality in the State. At the present time there are five companies in active operation, all making developments or shipping quicksilver in large quantities. There is the Oceanic, six miles from Cambria; the San Jose, El Rincon, and Tres Amigos, within eighteen miles of San Luis; the Sunderland, or, as more commonly called, the Lockhart mine, near Paso Robles; the Josephine, and last, though not least, the Ocean View mine, situated eleven miles east of San Simeon. In an interview with Mr. E. B. Burdick, superintendent of this mine, we learn the following facts: They have a body of ore developed for a distance of thirteen hundred feet in length and sixty-five feet in depth, with a width of one hundred and five feet. All of this immense body is pure ore, and will average not less than two and one-half per cent., or fifty pounds of metal to the ton of ore. This body of ore is equivalent to 443,625 tons, holding in its rocky embrace not less than a thousand tons of liquid metal. In the lowest depths of the mine yet explored, it is much richer, reaching six per cent. At a valuation of \$1,500 the ton for quicksilver, here is \$1,500,000. Allowing two-thirds of this amount as cost of production there is a profit of over half a million for the lucky owners of this mine, and one million to be circulated in our midst for labor and material. This estimate will be found considerably under the mark if any curious person should go over our figures, allowing twenty cubic feet for a ton of ore.

Having fully demonstrated the value of the mine the company are now busy with the erection of a first-class furnace and extensive hoisting works. Mr. Luis Janin, late of Virginia City, Nevada, has the contract for building the furnace, which is modeled after the Oceanic, with improvements designed by Mr. Janin. The machinery for the furnaces and hoisting works are all at San Simeon. Mr. Burdick in company with P. A. Forrester, Esq., of Cambria, came to town on Friday of last week, to engage teams to go and haul the machinery to the mine before the heavy rains of winter set in. He engaged seven six-horse teams which have gone up for the work. The hoisting works will be modeled after the latest and best in the land. The working shaft is to be of three compartments, two for hoisting and one for pumping.

The mine is situated in a heavily timbered country, and thus far a team has not been used for delivering their lumber from the saw mill to the works. They have a steam saw mill capable of cutting all the lumber they will ever want. The timber is a large yellow pine, many of the trees being three or four feet in diameter, and squaring two feet for sixty to seventy feet in length. Water is abundant for all purposes connected with the mine and reduction works. The company has built a grade from San Simeon to the mine, a distance of eleven miles, at a cost of \$5,080. The heaviest grade is only nine feet in one hundred. The road was surveyed by H. C. Ward, civil engineer, and constructed under the direct supervision of Mr. Burdick. He employed sixty men, and was 22½ days in completing it. It is said to be the best mountain grade in the country.

The company is incorporated in San Francisco, H. K. Moore being the President, and D. Buck Secretary. Among the heaviest owners in the mine are Messrs. F. Greenman and C. W. Kellogg, President of the Merchants' Exchange bank, of San Francisco. The company has applied for patents for its mines—there being four belonging to the company—and Mr. R. Harris has gone up to survey them. This is but a mere sketch of this enterprise, but must suffice until we get time to spend a week in and about Cambria, when we hope to do that section of country ampler justice than we have been able to heretofore.

Effect of Color on the Sensations.

Having recently achieved the luxury of a new carpet in our sitting room, we are all quite surprised at the effect the accidental but judicious distribution of colors in it has over feelings and sensations.

The quality is the ordinary ingrain, and the pattern a very old-fashioned one, of large, wavy green and bright crimson fern-shaped leaves on a white background, there being but three colors, white, red and green. The effect is one of indescribable warmth and comfort, such as never was experienced before, but is noticed by every one who comes into the room.

This hint is worth attention in the selection of carpets. What the result will be in hot weather remains to be seen. A little judicious selection and discrimination in such cases makes more difference than an ordinary unobservant person would suppose.

The same is true of wall papers, neutral tints, such as buff and violet being much cooler than more positive colors, such as bright crimson, green, etc.

Light colored or white hoods make the feet appear larger than black. Longitudinally striped clothing causes the person to seem much taller, while lateral stripes have the contrary effect.—*Ex.*

The Sierra Flume Company.

Some two or three weeks since the Plumas National intimates that the route for the Chipman-Hayward flume, from the Sierra mountains to the navigable waters of the Sacramento, was not yet decided upon, and that it would go by one of the two routes, viz: Down the North fork of Feather river, or from the foot of brave, bald old Lassen down Deer creek. Supposing the bulk of the timber looted by this company last summer to be in the vicinity of the Big meadows, we had supposed the flume for its transportation to the Sacramento valley would be down the North fork. But we understand that the surveyors found grave difficulties to be overcome along that turbulent stream, and that it has been determined to construct the flume on the Deer creek route. There is said to be no inconsiderable portion of their timber located in close proximity to this line of flume, and as it presents a much shorter and cheaper route, it has been adopted for their line of the flume. We learn these facts from Mr. Abbott, of the Big meadows. The company have already purchased from Mr. Gerko, of the Gerke ranch, some ten miles above Chico, a piece of land suitable for a dump for their timber.

The land lies on the Sacramento river, to which point their flume will extend. This will give the company water carriage from the point where the timber grows, to the markets of the world, and at the cheapest possible outlay, and must give them a tremendous advantage in the principal markets below, while they have the choicest timber region in the world to cut their timber in. During the summer season the lumber can be rafted down the Sacramento at a very trifling expense, and will be about equivalent to running a saw mill at Sacramento with plenty of timber at hand to work upon. As we have before remarked, while commenting upon this subject, this will be highly beneficial to the company, but will not prove remunerative to the section of country providing the timber. We believe it practicable to construct a railroad over the Deer creek route to the Big meadows, and cannot repress the regret that the company has determined to build the V flume, which does nothing but carry away, instead of the road. But it was not for us to say. The company have, probably, consulted their own interest in the matter, and chosen the cheapest way to get the timber to the markets of the world, leaving the region furnishing the timber to become productive after their operations of gathering the timber are over, or remain good for nothing. A railroad would carry in as well as bring away, and might make the country around Lassen as famous as the Alps of Switzerland, as it deserves to be.—*Butte Record.*

Carp Culture.

A little more than three years ago J. A. Poppe arrived in this State from Rhinefeldt, Holstein. A part of his baggage was a lot of small carp, five in number and six inches long. He began at once a system of carp culture, following the experience of the German carp farmers. He put his five small carp in the water at Sonoma, in August, 1872; one dying and four surviving in the new habitat. In the following May the fish had grown to sixteen inches in length and had given life to three thousand young fish. Since that time these fish have grown rapidly, and Mr. Poppe assures us that he finds sale for all his marketable fish at one dollar a pound. Mr. Poppe is at present desirous of extending the business of carp culture among those who have facilities for it, and is prepared to furnish the stock for beginning. He sends us the following items concerning the practice:

In Germany thousands of pounds of this favorite fish are raised and sold every year. The farmers there who are engaged in pisciculture have from five to seven ponds. The smallest is the breeding pond, from which the others are stocked. The contents of one pond are sold every year. Numbers of fish are floated down the rivers and canals in large boxes pierced with holes, through which the water passes in and out, thus delivering the carp to the consumer alive and fresh. They are a fish that need but little attention, are hardy, prolific, and do excellently on this continent. Their food may consist of wheat, barley, corn, peas, bran, blood, sour milk, or in fact almost anything. When well fed they will grow one inch per week for the first two or three months, after which they will grow slower in length but increase rapidly in weight. It will not do to breed them in ponds where any game fish are kept, as they will eat the young carp.

Farmers who have natural facilities on their places for making ponds, and who have access to canals or rivers communicating with large cities, can greatly increase their income with but small trouble and expense. There ought to be one person in every county who would raise choice carp as stock fish to sell to others to fatten for their own tables. It would be a cheap but sumptuous food, and at the same time very convenient, as they are ready to be eaten at all times of the year.

Mountain Lands.

Mr. Luntrell's bill in Congress and Mr. Ferral's move in the Legislature of this State seem to very fully embody the popular feeling on the subject of the proper mode of opening up the mountain lands of California to permanent occupation by bona fide settlers. The State Grange, P. of H., also, at their late meeting, endorsed the proposition so far as to allow actual settlers the privilege of locating 640 acres of such lands for homesteads and for grazing purposes.

It is certain that under the present laws these lands can never be brought into market so that the title can pass to any large extent. They consist chiefly of broken ranges, thinly timbered in the foothill lands, springy watered and wooded everywhere, and producing only light crops of native grasses. There are but few locations where the settler can select a quarter section, the chief part of which shall be suitable for cultivation. By far the larger portion is suitable only for grazing purposes. But if these lands were surveyed and set off in tracts of 640 acres or more—in no case less—and offered to settlers at a reduced price, the theory is that every tract would contain some little valley, with springs or rivulets, where the settler might make his home, cultivate a little patch for a garden, raise a few roots or perhaps cut a little grass to tide his stock over the few weeks that intervene between the destruction of feed by the early rains and the springing up of the new grass, which appears soon after, and thus utilize the great bulk of his claim for grazing purposes.

On the contrary if they are segregated into 160 acre tracts, the section which contains the valley and water privilege will be taken up, while the 480 acres will be worthless to any other person, and will be left unsold, and consequently unimproved to any great extent, for the reason that no one will pay the price required for a title. The consequences will be loss to the Government, imperfect development of the agricultural resources of the entire district and constant differences between neighbors who will each strive to get the advantage of the other in their efforts to use the unsold tracts which lie between their respective properties.

Four-fifths of the land at present unsurveyed in the foothills is now enclosed with rough fences by parties holding the small watering places, without yielding any revenue to the Government; while even the best portions of such lands are but imperfectly utilized by reason of the uncertainty of the tenure.

Mr. Luntrell's plan of throwing them open to purchase in tracts of 640 acres (or more if necessary) at the minimum price of fifty cents an acre, would soon result in the establishment of numerous well built homesteads and well cultivated tracts of land, on which vegetables and to some extent cereals, also vines, fruit and timber trees might be successfully grown, but the outlay for which cannot be afforded under either the present minimum price of \$1.50 per acre, or the uncertain tenure of a settler's title when the future contingency of legislation is uncertain.

If the law making power had set itself at work to devise some way to prevent a proper development of the foothill lands no more perfect plan could be devised for such a purpose than that now in existence. Some legislation is an imperative necessity in this direction. The only questions in that regard should be that of securing the benefit to actual settlers, the proper extent of the tracts into which the land should be segregated (from 640 to 1,280 being the extremes named), and the price per acre—fifty cents being the minimum figure which has been suggested. Of course no legislation should be made which would interfere with the rights of minors on the mineral sections.

The adoption by Congress of some plan of this kind will no doubt greatly facilitate the settlement of these lands, which constitute a very extensive area, and the permanent occupation and improvement of which would create a large amount of taxable property to aid in supporting the fast increasing expenses of our State Government.

A SERMON IN A PARAGRAPH.—President Porter, in Ysle, gave the following advice to the students of that institution the other day: "Young men, you are the architects of your own fortunes. Rely on your own strength of body and soul. Take for your star self-reliance. Inscribe on your banner, 'Luck is a fool, Pluck is a hero.' Don't take too much advice—keep at the helm and steer your own ship, and remember that the art of commanding is to take a fair share of the work. Think well of yourself. Strike out. Assume your own position. Put potatoes in a cart, go over a rough road, and the small ones go to the bottom. Fire above the mark you intend to hit. Energy, invincible determination with a right motive, are the levers that move the world. Don't swear. Don't deceive. Don't read novels. Don't marry until you can support a wife. Be in earnest. Be self-reliant. Be generous. Be civil. Read the papers. Advertise your business. Make money and do good with it. Love your God and fellow men. Love truth and virtue. Love your country and obey its laws."

A Company's Liability for Kissing by an Employee.

In the case of Craker against the Chicago and Northwestern company, the Wisconsin Supreme Court has given its decision. The plaintiff, a lady, took passage on a train on the Madison division, and the conductor of the train, while on the journey, forcibly kissed her. She brought suit against the company in the Circuit Court, and got a verdict of \$1,000 damages. The case was appealed, and now the Supreme Court decides as follows, the decision involving some important points:

A master is liable for a wrong done by his servant, whether through the negligence or the malice of the latter, in the course of an employment in which the servant is engaged to perform a duty which the master owes to the person injured.

It seems that the master should be liable in all cases for the servant's wrongful act done in the course of his employment, whether through negligence or malice.

A railroad company is bound to protect female passengers on its trains from all indecent approach or assaults; and where a conductor on a company's train makes such an assault on a female passenger, the company is liable for compensatory damages.

Exemplary damages cannot be recovered against the principal for a wrongful and malicious act of the agent, neither authorized or ratified by the principal.

A verdict of \$1,000 damages for the insult offered by defendant's conductor to the plaintiff in this case, held not so excessive as to authorize the court to set it aside.

THE THUMB AS AN INDEX OF CONTEMPT.—Scott says to hit the glove or the thumb was a horrid pledge of mortal revenge. In England thumb biting was practiced to goad an adversary into fighting. Dekker tells us that St. Paul's walk was notable for shouldering, jeerings, and hitting of thumbs to beget quarrels, and Shakespeare imports the fashion into Verona. When Gregory and Sampson espy two Montague men, out fly their swords; but prudent Sampson, to compel the others to take the initiative, bites his thumb at them, "which is a disgrace if they hear it." Challenged with the question, "Did you bite your thumb at me, sir?" he replies, "No sir, I do not bite my thumb at you, sir; but—I bite my thumb!" and in a few minutes the fray begins. It was not absolutely necessary to put the thumb to the mouth. In 1291 a rude fellow was sent to prison for casting vile contempt upon the clerk of the sheriff of London, by raising his thumb and saying, "Iphurt, Iphurt!" "in manifest contempt of our Lord." If one Neapolitan wishes to anger another, he places the palm of his right hand on the back of the left, and shakes the crossed thumbs, symbolical of donkey's ears, at him; a pleasant hit of pantomime answering to the "taking a sight" popular elsewhere—a sign of contemptuous defiance, said to be at least as old as ancient Assyria.—*All the Year Round.*

DIFFERENCE BETWEEN CYCLONES AND WHIRLWINDS.—In a memoir on cyclones and waterspouts, M. Monchez publishes some observations made by him while upon the ocean, and which, if correct, are quite important. According to his account, at or near the surface of the ground the current of air in the cyclone is always from below upwards, while in whirlwinds the movement is, on the contrary, from above downward. In the former case, the winds are winds of aspiration; in the latter case, the winds descend from the cloud in the form of a hag or tube, which terminates in a point. M. Monchez is consequently led to believe that waterspouts have no relation whatever to cyclones, having, in fact, opposite appearance and cause, an opinion in which some other scientists occur.

LEWIS DISTRICT.—This district is about thirteen miles from Battle Mountain and contains several fine mines. The mill, owned by Hildreth & Co., A. Evan, Wm. Humphrey and others, is of ten stamps with capacity for twenty, is running upon the ore from that district. They have on their own dump over two hundred tons of fine rock, working from \$100 to \$800, and are extracting not less than \$12,000 worth of this quality of ore daily. The tunnel on their mine is now in about 500 feet, and they have ore enough in sight to last five years. The mill is a new one, just being erected, and will be in running order and is expected to be set in motion this week.—*Humboldt Register.*

THE BREAKING UP OF LARGE MASSES OF IRON, has, as our mechanical readers are well aware, been a matter of considerable difficulty and expense. This is, however, according to the *Moniteur Scientifique*, now accomplished in the case of large guns, by placing dynamite at the lower end of the gun and filling the bore with water. The explosion of the dynamite, transmitting its force through the water, fractures the gun.

MORE PLANETS.—A German astronomer has discovered two new small planets, not visible with the naked eye, in the constellation *Aries*. This makes the number of the lesser planets one hundred and fifty-three.

BOSTON has a woman newspaper carrier who is 87 years old.

USEFUL INFORMATION.

Re-seating Chairs.

Cane seated chairs are very apt to wear out and then, if their owners are far from the upholsterer, they are thrown aside as useless. Any woman with a little ingenuity can repair them so they will be "good as new." Take any piece of bagging or burlaps—no matter how coarse—and fit them to the chairs, cutting them large enough to wrap about the rounds that hold the splints or canes. Now sew it on with the darning-needle and twine twice doubled, and turn up a hem, as you sew on the burlaps. When half fitted, stuff it with "excelsior" shavings of poplar wood; or if you have them, cut off layers from old quilts, and spread them smoothly over the chairs, under the burlaps. The layers of cotton can be tacked together before they are put in, and then they can be laid more smoothly upon the old canes. Fine hay will also answer for stuffing when nothing better can be procured. Now sew down the other two sides, and take pieces of carpeting, or of enameled cloth, or colored rep, or all wool dress goods, and tack them closely down with large silvered or brass headed nails, which come for the purpose, and behold! your chairs are far handsomer and more comfortable than before. The materials have, possibly, cost you but little, for many an attic would furnish them all but the nails, which must be procured at the upholsterer's. Gimp to match the ground color of the cushion, or even worsted braid, is desirable to place along the edges of the covering, and drive the nails directly through it. This makes a handsomer finish to the cushion.—*Exchange.*

VALUE OF THE COMMON BROOM PLANT AS A FIBER.—The common broom plant is announced as furnishing a fiber equal, and in some respects superior, to that of hemp and flax. In view of the great extent to which this plant occurs wild in Southern Europe, and the ease with which it is cultivated, such applications, not indeed new, but only more recently revived, promise important results. Its fiber can be very minutely divided, and as it retains heat, it can supply the place of wool. It receives the most delicate dyes as well as an animal fiber, and successfully resists the action of acids and salt water without undergoing any change or losing its tenacity. Its strength is one-third greater than that of hemp, while it is thirteen per cent. lighter. It can be furnished, delivered at the factories, for about £2 per ton. The fiber may be obtained by soaking the stems for a few days in warm water, or else by means of a chemical solution of little cost.

TO AVOID WET FEET.—Here is another way to prevent water from getting through shoes. The composition also makes a good harness dressing. Take neatfoot oil, one and one-half pints; heesewar, one ounce; spirits of turpentine, four ounces; and stir until cold. Spread and rub this composition over the leather while it is damp; leather will absorb oil and grease better when damp than when dry. For the soles, take pine tar and rub it in before the fire until the soles will absorb no more. Three or four applications will be needed. The durability of the soles will be much increased. If this preparation will do what is claimed for it, it will be invaluable to miners, who are now compelled to suffer from wet feet, or endure the almost equal danger and inconvenience from the constant use of rubber boots in wet weather.

A CANE WITH A CANDLE.—A very simple walking cane, with a candle enclosed, which might be convenient for use in dark passages, or even for reading in railroad cars, has been invented by a German. The top portion consists of a hollow cylinder screwed on, and containing a spring to press upward as fast as consumed, a candle in it. It is closed by a screw cap, which forms a convenient top.

HOW TO USE POSTAL CARDS.—Anything whatever, except an address, written or printed on the side intended for the address renders postal cards unmailable, and the same cannot be legally forwarded unless prepaid at the letter rate—three cents. But if, by inadvertence, it reaches its destination without such prepayment, it is chargeable with double the letter rates, minus the one cent originally paid for the postal card.

PLATING COTTON WITH SILK.—A method of covering cotton with silk has been devised. The silk is dissolved in hydrochloric acid, or an ammoniacal solution of copper or nickel. Water is added until the solution begins to cloud, when the cotton, previously mordanted, is immersed in it for a few minutes. When taken out it will be found to be plated with silk.

TO REMOVE GREASE SPOTS FROM PAPER.—Warm the paper and cover it on both sides with dry, finely ground pipe clay, and place it under a slight pressure for a few hours. Then dust off the clay, and remove the fine dust that still adheres by means of a good piece of India rubber.

In 1840 the first experience in photography was made in Paris by Daguerre.

Oil colors will adhere to cement if primed with boiled linseed oil.

Apparatine—A New Anti-Incrustator.

A new anti-incrustator has lately been introduced under the name of apparatine, which is prepared by stirring up 16 parts of potato starch in 76 parts of water, and then adding eight parts of potash or soda lye, at 25° Baume, the whole to be thoroughly mixed together. In a short time the mixture forms a thick jelly, and it is then beaten up vigorously for a time, when it forms a colorless, transparent substance, slightly alkaline to the taste, and of a strong glue-like consistency. It dries slowly in the air, without decomposition, and when perfectly dry resembles horn, but is more flexible. When introduced in small quantity into steam boilers it prevents their incrustation. It is also capable of nearly all the applications of ordinary gelatine, and is especially adapted for sizing textile goods of all kinds, imparting to them a hitherto unattained smoothness. When applied to goods and dried it is perfectly insoluble, as three or four washings in hot water have proved to have no effect upon it. It can also be used as a thickening in calico printing. Several of the technical journals speak of this substance as a very important addition to the resources of the manufacturer and dyer. Care must be taken to retain it in air tight vessels until it is used, as it is not easily rendered soluble again when it once becomes hard.

NEW LOCOMOTIVE ATTACHMENT.—Among the recent novel American inventions is one which is described as consisting of a telescopic arrangement of tubes projecting from the front of a locomotive engine, and so arranged that when pushed in by contact with any object—a cow on the track, for instance—a valve is opened, and a series of projectiles are thrown out, which quickly remove the obstruction. The *Engineer*, commenting on this product of American genius, suggests as an improvement that the tubes be replaced by a projecting spar, to the end of which a torpedo might be attached, which may be exploded by electricity under the least, and so accelerate its movement!

PATENT LEATHER.—Newark, N. J., produces most of the patent-leather made in this country, and we import none of this kind of goods except patent calf-skins. Our manufacturers have pushed their goods into the foreign markets, and have succeeded in competing with foreigners in their own countries. This branch of business has hardly felt the dull times, owing to the fact that it depends so largely on the foreign market. The manufacture was begun in Newark, in 1813.

GOOD HEALTH.

Health of Farmers.

The Massachusetts Board of Health is out with its fourth annual report, in which is to be found an interesting paper on the longevity of the farmer's life. It says the evidence collected from country physicians throughout the State for the last twenty-eight years, shows that the average length of the life of a farmer in that State is fifty-five and a fourth years. This is much longer than that of any other class of citizens. The class most nearly approaching farmers, viz., out-door mechanics, live only fifty-two and a half years on an average.

The almost unanimous belief of those physicians and the compiler of the paper is, that farmers might live much longer than they do, by exercising more care in choosing, cooking and eating their food, in avoiding overwork and exposure to change of weather, and the use of foul drinking water. Their food consists too much of pork, pies and saleratus bread and cakes. The cookery is bad and meals are eaten too quickly for good digestion, when work hurries. More vegetables and fruit should be eaten, and more rest taken. More cleanliness as regards out-houses, sinks and backyards, should be observed, and more care taken to avoid leaving cess-pools, sinks, etc., nearer to a well than thirty feet at least.

DRY AND CRACKED FINGERS.—The *New York World*, in answer to a correspondent says: We know, by experience, something "about dry and cracked fingers," for we once worked on a farm and was careless, as many men and boys are, about properly cleansing our hands. It was our own fault that we had sore hands, as it is yours. We finally learned to avoid the suffering by washing our hands clean with castile soap and hot water and wiping them dry before exposing them to the cold air. Before going to bed at night we used to rub them with glycerine and dry it in before the fire. We never had any trouble afterwards. If at our work we got our hands wet when they were dirty, we took pains to rub them dry as soon as we could before exposing them to the air.

BEEF FOR DIPHTHERIA.—A young lady was recently attacked with diphtheria in a virulent form. Slices of fresh pork were bound on her neck without any good results. Her father heard that the city doctors were using beef extensively for the same purpose, tried it, and in six hours the beef turned green, relieving the sufferer.—*Ex.*

PERFECT SLEEP.—The sleep of perfect rest is dreamless—a kind of sleep not produced by laudanum, chloral or any other drug. Remember this, young people, at the beginning of your lives. Do healthy work enough to weary you, and you will sleep a healthy sleep, and be doubly sure of a good old age.

Death in the Dishcloth.

A lady says in the *Rural World*, when some of you are sure to be down with typhoid fever; when neighbors are neglecting their own work to nurse you; when doctors are hunting in cellars and old drains for the cause, let me whisper in your ear—look to your dishcloths. If they be black and stiff and smell like a "bane-yard," it is enough—throw them in the fire, and henceforth and forever wash your dishes with cloths that are white, cloths that you see through, and see if ever you have that disease again. There are sometimes other causes, but I have smelled a whole houseful of typhoid fever in one "dishrag." I had some neighbors once—clever, good sort of folks; one full fair of them were sick at one time with typhoid fever. The doctor ordered the vinegar barrels whitewashed, and threw about forty cents worth of carbolic acid in the awl-pail and departed. I went into the kitchen to make gruel—I needed a dishcloth and looked about and found several, and such "rag!" I burned them all, and called the daughter of the house to get me a dishcloth. She looked round on the tables: "Why," said she, "there was about a dozen here this morning," and she looked in the woodbox and on the mantelpiece, and felt in the dark corner of the cupboard. "Well," I said, "I saw some old, black rotten rags lying round and I burned them, for there is death in such dishcloths as these, and you must never use such again."

I "took trams" at nursing that family four weeks, and I believe those dirty dishcloths were the cause of all that hard work. Therefore, I say to every house-keeper, keep your dishcloths clean. You may wear your dresses without ironing, your sun-bonnets without elastics—but you must keep your dishcloths clean. You may only comb your head on Sundays, you need not wear a collar, unless you go from home—but you must wash your dishcloth. You may only sweep the floor "when the sign gets right," the window don't need washing, you can look out at the door; that spider web on the front porch don't hurt anything—but, as you love your lives, wash out your dishcloth. Let the fox-tail get ripe in the garden (the seed is a foot deep any way), let the holes in the heels of your husband's footrags go undarned, let the sage go ungathered, let the children's shoes go two Sundays without blacking, let two hens set four weeks on one wooden egg—but do wash out your dishcloths. Eat without a tablecloth; wash your faces and let them dry; do without a curtain for your windows, and cake for your tea—but for heaven's sake, keep your dishcloths clean.

PREVALENT ERRORS WITH REGARD TO APOPLEXY.—A medical authority writing to the *New York Tribune* regarding the death of Vice-President Wilson, corrects one or two very prevalent errors with respect to apoplexy. The symptoms of this disease, so dreaded and so sudden in its attacks, are due to a lack of proper supply of blood to the brain, and not, as is generally supposed, to an accumulation of "rush of blood to the head." The rupture of the cerebral blood-vessels is due to weakness of its coats, which is the result of general debility or ill health. In the great majority of cases there are no premonitory symptoms. The attack may be preceded by a sense of weight or fullness, vertigo, flushing, etc., but these symptoms are never to be relied on. The liability to an attack increases progressively from the age of twenty years and upward. Another popular error is that persons with short necks, florid faces, and full habit are peculiarly liable to this attack. Recent researches develop the fact that the majority of persons attacked are either spare or of ordinary habit of body. Physicians conclude that unless one attack has occurred there are but few, if any, physical signs or premonitory symptoms which will warrant the prediction of an attack in any case.

CARELESS HANDLING OF CHILDREN.—I wish to enter a protest in the name of all nervous persons and of the injured little ones against the reckless way in which many heedless persons express their love for children, such as lifting them up by their heads, tossing and catching them in the air, carrying infants on their hands without any support to their backs, and otherwise endangering their limbs or senses. I have now in my mind the case of a man who was rendered a cripple for life through his father's carelessness in lifting him by the ankles, while he was a small child, he (the father) having unfortunately lost his balance and turned the child's ankles in such a way that he was lame ever afterward. Two different persons have told me that they knew when too late that by their thoughtless play with them they had seriously injured infants entrusted to their care, one case resulting in spinal disease and the other in fits. And yet it is a sight daily to be seen, that of people doing these things. Do give the little folks tender handling!—*Rural New Yorker.*

REMEDY FOR RHEUMATISM.—A correspondent of the *New York World* sends that journal the following: Here is a remedy for rheumatism I have tried in my family and found most excellent for inflammatory rheumatism—it is a charity to print it: Four ounces saltpetre in one pint of alcohol; shake well and bathe parts affected; wetting red flannel with it, lay it on. It does not cure, but takes away the redness, reduces the swelling, and relieves the torment and agony.

DOMESTIC ECONOMY.

Different Ways of Preparing Cabbage for the Table.

An excellent cold slaw is made by shredding a solid head of cabbage with a thin, sharp knife, or a slaw cutter, then placing the cut cabbage in your dish, pour over it a dressing made by heating a pint of vinegar scalding hot, then heating into it quickly one beaten egg, with a lump of butter as large as a walnut, and a tablespoonful of sugar. The cabbage should be slightly sprinkled with salt and pepper as it is put in the dish.

To fry cabbage, chop or shred quite fine, have a spider bot on the stove, in which is a small quantity of batter or meat drippings, season, and put in the cabbage, and cover tight, stirring often and taking care it does not scorch on the spider. Cooked in this way it is very sweet and nice.

Cabbage makes a nice dish also cooked by dropping into salted boiling water, and when tender taken out, minced fine with a knife, then pouring over it a dressing made by taking a piece of butter the size of an egg, and a coffee cupful of boiling water; cut up the butter with a half teaspoonful of flour, and stir it gradually into the hot water. When it boils, stir in a dessert-spoonful of vinegar, and a dash of pepper, with a little salt. For the sauce, thick sweet cream is an excellent substitute.

For hot slaw prepare the same as for cold slaw, cook tender, and pour over the dressing, or merely season with vinegar before dishing up.

Somebody has said that corned beef with boiled cabbage makes the best three hundred and sixty-five diamers a man can eat in a year. To realize the full measure of excellence the quality, curing and cooking of the beef should be considered, but with this, I have nothing in this letter to do. Perhaps some sister can give us directions by which we may secure perfection in this part of the process. As to the cabbage, have a solid head stripped of the outside leaves, except one layer, divide it into quarters by gashing down nearly through to the lower end of the core. Skim the floating grease as nearly as you can from the top of the water in your boiling pot of beef, and about one hour before dinner time drop in your cabbage and keep it boiling steadily and slowly until you are ready to dish it. Now, carefully lift it out with a skimmer and lay on a platter, draining well, take off the outside leaves left, and your cabbage will come out clear and free from grease or scum.

A NEW PROCESS OF MAKING BREAD.—M. Cocil, a French engineer, has invented a new process of preparing the materials for making bread, which has received the approval of the minister of war and will hereafter be adopted in the French army. By this process an increased percentage of the nutritive properties of grain is retained, so that by avoiding the usual grinding and wetting, the grain that would make 115 pounds of bread in the ordinary way will make what is equivalent to 140 pounds. The new process is described as follows: The unground grain is first steeped in water, after which it is placed in revolving cylinders, by which it is deprived of its outer husk, which contains but four or five per cent. of nutriment. The grains are then softened by forming them into a thin sponge, and keeping them for a space of six to eight hours at a temperature of seventy-seven degrees Fahrenheit. They are then crushed under and made into dough, with salt and water, as usual.

BAKED BEANS.—Many people do not understand how to make nice baked beans. One of the most serious troubles is, they don't give them time enough to bake. Bake them slowly all day Saturday, and if convenient let them stay in over night, baking full twenty-four hours, and our word for it, your beans will come out in the morning smoking, with a flavor that will make your mouth water to taste them, and your breakfast will be the best you ever had. We sometimes see persons who only have a moderate liking for baked beans, who invariably bake them three or four hours, and that is why they do not like them any better. A day and a night is none too much time to bake these excellent, having parboiled them only a few moments, until the skins will crack when the air comes to them.

VEGETABLES.—These should never be washed until immediately before being prepared for the table. Lettuce is made almost worthless in flavor by dipping it in water some hours before it is served. Potatoes suffer more than any other vegetable through the washing process. They should not be put in water till just ready for boiling.

ORANGE PUDDING.—Four sweet oranges peeled and picked to pieces and put in a deep pudding dish with two cups of sugar. Put a quart of milk, the yolks of three eggs, and two dessert-spoonfuls of corn-starch on to boil. Take off, cool it, and pour it on the oranges. Then beat the whites to stiff froth, put it over the pudding and place in the oven until it is of a light brown color.

TO CLEAN A NURSE.—Take a wooden bucket, fill it half full of wheat flour. Then dip your nubia up and down in the flour until it looks white, shake thoroughly, when it will be as nice as new, and not have the drawn appearance which washing gives.

MINING SCIENTIFIC PRESS

W. B. EWER..... SENIOR EDITOR.

DEWEY & CO., Publishers.

A. T. DEWEY, GEO. H. STRONG,
W. R. EWER, JNO. L. ROONE

Office, No. 224 Sansome St., S. E. Corner
of California St., San Francisco.

Subscription and Advertising Rates:

ADVERTISING RATES.—1 week, 1 month, 3 months, 1 year.
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SAMPLE COPIES.—Occasionally we send copies of this paper to persons who we believe would be benefited by subscribing for it, or willing to assist us in extending its circulation. We call the attention of such to our prospectus and terms of subscription.

THE ORIGINAL ARTICLES in this paper are mostly set in solid type, giving in our columns one-third more reading than is contained in ordinary leaded matter.

San Francisco:

Saturday Morning, Jan. 15, 1876.

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NEW ADVERTISEMENTS.

"Scribner's Monthly." Scribner & Co., N. Y.; Machinery Supplies, Treatwell & Co., S. F.; Burr Stone Mills, Edward H. Mills, New Haven, Conn.; Steam Engines, A. L. Fish & Co., S. F.

The Mining Debris Question.

We give in this issue the proceedings of the mass meeting of citizens of Sutter and Yuba counties in relation to the mining debris question. We also give the preamble and resolutions offered in the legislature by Assemblyman Berry, of Sutter, on the same subject. It is hardly probable that any decisive steps will be taken in the matter at this session of the legislature, but it will be very generally discussed. The miners have the best of it, from priority of rights and general established custom; and it is probable that the agriculturists have, in a measure, injured their cause by the exaggerated figures presented at the mass meeting. The miners, as yet, have not considered the opposition of sufficient importance to require an answer, but our columns are open to those who wish to bring facts in their possession before the public. The question is a very important one and no hasty steps should be taken.

JOHN SINNAMON, late superintendent of the Ames iron works at Oswego, N. Y., has gone to Albina to assume the same position in the Oregon iron works, which manufacture portable and farm engines.

Bullion Product of 1875.

The very gratifying increase in production of precious metals for the year just past by States and Territories west of the Rocky mountains is something wonderful. From year to year the production increases, while from year to year people continue to deny mining and mining interests. It is only when the annual returns come in that this class of people are not heard from. The returns this year are \$6,487,982 in excess of 1874, as will be seen from the following report of John J. Valentine, superintendent of Wells, Fargo & Co.'s express.

EDITORS MINING AND SCIENTIFIC PRESS: We enclose you herewith a copy of our Annual Statement of Precious Metals produced in the States and Territories west of the Missouri river, including British Columbia and the West Coast of Mexico, during 1875, which shows an aggregate yield of \$80,889,037, being an excess of \$5,487,982 over 1874, the greatest previous annual yield in the history of the Coast. Nevada, Colorado, Mexico, Oregon, British Columbia, Montana and Arizona increased, while California, Idaho, Utah and Washington decreased. The increase is actual except for Mexico, Oregon and Arizona, where it is apparent rather than real, as compared with other years, a regular product being accounted for and reported herein, hitherto omitted. The decrease in California was in the main occasioned by a stinted supply of water for placer and hydraulic mining. The increase in Colorado and Nevada is notable, also the fact that Nevada yields more than half of the whole product of the country. Prof. E. W. Raymond credits New Mexico (omitted in our statement) and Arizona combined, with \$387,000 which is a liberal allowance. We have been unable to obtain any data that justifies a showing so favorable. Present prospects indicate an aggregate yield of \$90,000,000 for 1876, of which Nevada will doubtless produce \$50,000,000. Respectfully yours,

J. J. VALENTINE, General Superintendent.

Statement of the amount of Precious Metals produced in the States and Territories west of the Missouri River during 1875.		STATES AND TERRITORIES	Amount
California	\$14,422,010	Gold Dust and Gold Bars	\$14,422,010
Nevada	196,883	Gold Dust and Gold Bars	196,883
Idaho	739,133	Gold Dust and Gold Bars	739,133
Utah	1,135,338	Gold Dust and Gold Bars	1,135,338
Montana	2,268,000	Gold Dust and Gold Bars	2,268,000
Arizona	4,388	Gold Dust and Gold Bars	4,388
Colorado	22,500	Gold Dust and Gold Bars	22,500
British Columbia	2,227,444	Gold Dust and Gold Bars	2,227,444
Mexico	68,117	Gold Dust and Gold Bars	68,117
Total	1,015,412	Gold Dust and Gold Bars	1,015,412
	\$23,049,861	Gold Dust and Gold Bars	\$23,049,861
	\$2,099,402	Silver Bullion	\$2,099,402
	\$1,080,287	Silver Bullion	\$1,080,287
	\$13,450,274	Platinum	\$13,450,274
	\$30,880,067	Platinum	\$30,880,067
	\$74,401,065	Platinum	\$74,401,065

Nevada again heads the list and California comes second. The increase in Nevada over 1874 is \$5,026,146. The decrease in California has been \$2,547,380; Oregon has gained \$455,976; Washington has decreased \$73,603; Idaho has fallen off \$325,102; Montana has gained \$134,111; Utah has fallen off \$223,784; Arizona has gained \$83,028, although we do not consider the figures from that section as reliable as others, as so much bullion goes through private hands, of which Wells, Fargo & Co. would have no account. Colorado has gained \$2,108,412; Mexico has gained \$1,609,773. The figures from Mexico cannot be considered as full as they should be for the reasons given concerning Arizona. British Columbia gave \$140,396. The total increase of all over last year amounts to \$6,487,982. This is a most gratifying showing. Nevada has had a chance to get ahead of all by her wonderful bonanza on the Comstock, and it is expected that the increase will be still greater from that section next year. We shall have more to say on this subject in our mining review in the next issue.

Notices of Recent Patents.

Among the patents recently obtained through DEWEY & CO.'S SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of mention:

PROCESS OF LEVELING LAND.—THOS. R. LOWE, Centerville, Fresno county, Cal. The object of this invention is to provide a simple and effective process for leveling uneven or hilly land for agricultural purposes, in order to render it susceptible of being more easily irrigated and cultivated so as to produce crops of a uniform growth. Much of our agricultural land lies in hills and hollows, so that a large portion of the work of plowing, sowing and reaping must be done to a great disadvantage on side hills, while that portion of the crop which grows in low places is generally stronger and more thrifty than what is grown on the higher land, and for this reason: Much more labor is required in harvesting than if the crops were uniform throughout.

Mr. Lowe's invention contemplates reducing this kind of land to one general level by means of a stream of water forced against the hills or

higher portion of the land, so as to wash it into the hollows and thus produce a level surface out of what was before hilly and uneven.

In carrying out this invention Mr. Lowe uses water, which has been placed by nature or by artificial means, at a sufficient elevation to provide the requisite pressure. This water is conducted through hose to the proper place. There levees are thrown up wherever it may be necessary around the tract of land, and at intervals in these levees are constructed gates, which can be opened when desired. The stream of water is then applied against the hilly land, either by water pressure or engine, until the higher portion is loosened up and reduced to the consistency of mud, and then a large quantity of water is turned into this mud, so as to carry it to the lower land or hollows, and thus bring the entire surface to a uniform level.

PHOTOGRAPHIC BACKGROUNDS.—I. W. TABER and THOS. H. BOYD.—This invention consists in the employment of a stationary wire screen in front of a canvas background, for the double purpose of protecting the canvas from injury and providing a compound background picture. The wire cloth has painted upon it a portion of the scene which is to be employed as a background picture. The painting thus delineated should not fill the meshes or interstices of the wire cloth, so that when the photographic background is produced upon the card, it will have a peculiar softness, owing to the rays of light passing through the meshes of the cloth, and striking the opaque or dead-colored canvas screen behind it. A very convenient arrangement, and one which will produce beautiful effects can be obtained by painting a fixed scene upon one portion of the wire screen, while the remaining portion is of a flame color, and then painting the canvas with a picture opposite the plain portion of the wire screen, and an opaque or dead color opposite the painted portion of the wire screen, thus producing a combination screen that can be changed by substituting other canvas screens with other paintings behind the wire, so as to retain the permanent design of the wire screen, thus providing a variety of views with the same main feature or foreground. The wire screen will then protect the canvas from injury, while it is not liable to be injured itself.

LEVER AND RACK FOR GANG PLOWS.—DANIEL KENDIG, Napa City, California. This invention relates to certain improvements in the operating levers and racks for gang plows, by which the inventor is enabled to do away with the strong spring heretofore needed to hold the lever to its place, where the rack was made upon the side, and the consequent necessity of considerable strength to operate the levers. In all plows in which two levers are used, one of the levers works about a center which is not the same as the center of motion of the other. As a consequence, this first lever must have a sliding motion up and down as it moves along the rack, and the rack was put upon the side and a long catch upon the lever was necessary to hold it at different points. By reason of the strong spring which holds the lever against this rack the operator must not only push the lever forward or back, but also press it strongly to one side, which is a difficult operation. In this improvement the rack is made on the top of the semicircle. The lever is attached to the lower end in the usual manner and passes up at one side of the semicircle. The strap which guides it passes over the semicircle, and has an arm extending up along the lever to near the top, where another strap clasps the lever. These two straps and their connecting arm will retain their relative positions in moving forward and back upon the semicircle, while the lever will be free to slide up and down, and accommodate itself to the varying center of motion. A nail to engage the rack is used.

WATCH CLEANING FLUID.—A. MONNIER, Sacramento. This is a compound for cleaning watches and other jewelry or other mechanism, (which contains no silver,) without the aid of a brush or any friction, with alcohol or chalk, or other substances, thereby preventing the wear which is usual in such cases and cleansing much more perfectly and with less time. The fluid can be used for brightening and removing corrosion from steel, brass or gold jewelry and other articles. It is of especial value in cleansing watches with nickel movements, and by its use the damaging wear of the ordinary method is avoided. With it a watch can be thoroughly cleaned of rust, grease and foreign substances in twenty minutes, more easily than can be done in two hours by the ordinary process.

LAND DECISION.—In the case of H. W. R. CROUCH, agricultural claimant against sundry mineral claimants, involving the title to twenty acres of land near Grass Valley, California, the Commissioner of the General Land Office has rendered a decision of general interest to mine owners and agriculturists in the mining regions. He holds that the land in question must be excluded from Crouch's pre-emption entry, because, although it is not mineral land, it is of little, if any value for agricultural purposes, and is essential for the proper working of deep gravel mines in its vicinity.

The bullion product of Park county, Colorado, for the past year, was over \$1,000,000.

The Fryer Process.

The Mining and Railway Register, of St. Louis, has found a "mare's nest," and "exposes" the Fryer process by publishing an extract from the Patent Reports, describing what it supposes to be the process. The *Alta* of this city copies the remarks of the *Register*, prefacing them with the following paragraph: "Large promises have been made by this invention, and it is everybody's wish that it will prove a success. But if the remarks below are correct, then the sooner any such humbug is exposed the better for the community and the mining interests. These remarks are taken from the *Register* bearing date of December 30th."

"Much mystery has been affected by certain parties concerning what has gained some notoriety as the 'Fryer process.' If there is no more of it, or in it, than what may be found in the subjoined description of the patent just issued, we would expect nothing from it but mortifying failure and needless loss of money. There is nothing presented herein but an attempt to imitate the 'Spencer process,' in which Spencer failed so completely eight years ago in St. Louis. Volatilizing the precious metals from gangue matter, and recovering by condensation, will not answer. It's old, and a failure."

"170,625. Apparatus for roasting gold and silver ores, Robert M. Fryer, New York city, N. Y., assignor to the Fryer Noble Melting Company, of New York. The fuel and quartz are fed in through the door. The heat of combustion generates steam in the jacket, which passes up, and issuing through a circular perforated pipe in the stack, causes a draft. The metallic fumes, as the issue from the furnace, are condensed by water falling from the cone, and are collected in the upper water jacket. The movable bottom is lowered, and carries the reduced charge to any point desired."

It happens, however, that this is not by any means the 'Fryer process.' The patent above mentioned is simply that on the furnace used by Mr. Fryer in the preliminary steps of the process. His condensing apparatus is only intended to catch such fumes as may attempt to escape, but he does not attempt to volatilize all the metals from the gangue, and then condense them. Instead of using a blower to force a draft in his furnace, he uses a steam jet to draw the air through. Instead of using a separate boiler to generate this steam he gets his steam from the water in the water jacket of the furnace. There is nothing of any very great novelty in the general arrangement of the furnace, but the details of construction make it effective for the purpose for which it is intended.

So, instead of the patent No. 170,625, given above, being the Fryer process, it is simply the furnace used in the preliminary stages of the process. The ore is afterwards worked by a peculiar system of dry amalgamation, which has not yet been made public. It will be time enough to pass judgment for or against the process when the details are made public, so that some intelligent opinions of its merits can be formed. For the present unfavorable criticisms are hardly fair, for the hearsay condensation of its working, (all most of us have 'to judge from,') is undeniably favorable; when it shall transpire that the promoters are endeavoring to swindle the community, or that their assertions are unreliable, it will be time to expose the game. So long, however, as they pay their way honestly, ask money from no one, put up big works, and do what they say they will, they undeniably have a right to a respectful hearing, which should be awarded to them.

OUR EDITORIAL ROOMS.—The editorial and composing rooms of the Press have, for the past two weeks, been in a state of almost hopeless confusion, and we are just beginning to get settled again. Carpenters, whitewashers and painters have run riot in our sanctum, but although their presence was a nuisance at the time, the result of their labors has made a great difference in the appearance of the office. The compositors, pressmen, mail clerks and assistants now have more commodious and convenient quarters, and the editors pride themselves on the improved appearance of the sanctum. The editorial rooms have been divided off by partitions, so that each writer has a "box" by himself, where the conversation of others will not annoy him. The partitions and other wood work glisten brightly with a handsome coat of Averill chemical paint, which has been well put on, and which changes entirely the appearance of the rooms. They are now light and airy, and the glossy appearance of the paint makes everything shine and look cheerful. What the painters did with the dust we do not know; but it has all disappeared, and with it a ton or more of pamphlets, papers, etc., which have been accumulating for several years. We now have our library in order and conveniently arranged. The entrance to the editorial rooms has also been changed, and we no longer have to pass through the composing room. The noise of the presses and machinery is, moreover, deadened by the partitions, so the rooms are quieter and better adapted for the purpose for which they are intended. When our friends from the interior favor us with a call, we can now show them as comfortable and convenient editorial rooms as there are in the city. As we feel pretty happy over it, we couldn't help telling our readers of our luck.

The Mining Debris Question.

The most important business in the Legislature on Saturday was the presentation by Assemblyman Berry, from Sutter, of a preamble and set of resolutions on the question of mining versus agriculture, which has lately given rise to some controversy between important sections of the State. Following are the preamble and resolutions:

To the Senate and House of Representatives of the United States, in Congress assembled:

First—Your memorialists, the Legislators of the State of California, respectfully represent to your honorable body, that the system of hydraulic mining, as now prosecuted upon the headwaters of the Sacramento river, the Feather river, the Yuba river, the Bear river, the American river and numerous other smaller streams, all of which flow into the Bay of San Francisco, is having the direct effect of covering up all the rich alluvial lands of the upper Sacramento valley to a depth of from one to twenty feet with an unproductive debris, thereby destroying many millions of dollars in property, and rendering desolate the homes of hundreds of actual settlers.

Second—We would further represent that at this time, from the immensely improved appliances in use for said hydraulic mining, and the construction of immense reservoirs and numerous ditches rendering water for such mining purposes cheap, hundreds of miles of gravel silt and beds are now being and will be washed down upon our valleys that heretofore would not pay for mining. In fact, this process of mining is yet in its infancy, having been in operation but about fifteen years. It is thought by those competent to judge that in the next twenty years it will increase manifold.

Third—We would further respectfully represent that most of the above named streams have already been filled to their highest banks with gravel, sand and mountain debris, and that all the cereal-producing lands in the upper portion of these valleys are already destroyed, and that many of our beautiful cities and towns are almost annually inundated; that our Capital city and magnificent State House are threatened with speedy destruction, and that unless the threatening danger is speedily averted the most inviting and productive valleys on the continent will be rendered wholly uninhabitable.

Fourth—We would further represent that upon the Yuba river there have already been destroyed and abandoned twenty-four sections of land, which to-day in its primitive condition would be worth more than \$2,000,000; thirty-six sections on Bear river, worth \$1,500,000; sixteen sections on Sacramento river, worth \$750,000; eight sections on Feather river, \$500,000; ten on American river, worth \$600,000; twenty-two on other smaller streams, \$1,000,000; total, \$6,350,000. This is a destruction of lands alone; the improvements that have been destroyed and the personal property that has been driven away from those lands, would amount to as much more, to say nothing of the depreciation of adjacent property, and the general retardation of the prosperity and business enterprise of our State.

Fifth—We would further represent that our farmers in the locality of these streams have for a number of years past been building and constructing a succession of levees and embankments along the margin of the low lands adjacent to those streams at a cost of more than two million dollars, and that the inhabitants of Sacramento have filled in and raised the business portion of said city to a height of fifteen feet, and have surrounded the entire city with an embankment of the same height. This work cost more than one million dollars. That the city of Marysville has expended hundreds of thousands of dollars in surrounding herself with a series of embankments, notwithstanding which, less than twelve months ago, she was inundated, and suffered the loss of more than a million of dollars, and to-day the bed of the Yuba river is at a higher elevation than her streets, and its waters are kept off them only by a narrow embankment of earth; and that other towns and villages have already and are yet expending vast sums of money in resisting the encroachments of the water and debris; and that the inhabitants of the above cities, towns, villages and localities have been and are now taxed to their utmost tension, hoping to preserve to themselves and families that portion of our villages not yet entirely and irrevocably destroyed. The result of all their efforts has been temporary, precarious and insecure protection, an exhausted treasury, and total destruction in the near future. Experience has taught them, and demonstrated most clearly that they cannot remove the debris from the rivers and water courses and raise embankments as fast as the process of hydraulic mining fills them up. They find themselves helpless, and, without aid, cannot much longer escape destruction.

Sixth—We would still further represent that our navigable rivers, the Sacramento and the Feather, upon which we are dependent for cheap fares and freights, are about destroyed—so much so that they can only be used in high stages of water, thus depriving us of the highways furnished by nature, which are indispensable to our prosperity, and forcing us to adopt more costly means of transportation.

Seventh—We would further represent to your honorable body that the bay of San Francisco, the finest harbor in the world, is menaced. T. J. Arnold, engineer of the State Board of Har-

bor Commissioners, has estimated that debris is being washed into the bay in sufficient quantity to cover annually one square mile to a depth of forty-one feet, and that it will take but fifteen years to fill Suisun bay, and but thirty-one years to complete the destruction of San Pablo bay, after which the bay of San Francisco proper is the only receptacle left for the entire debris washed from the mines.

The above estimates are founded upon the discharge of debris that is actually now occurring. When we consider the wonderful improvements already made and likely yet to be made in the process of hydraulic mining, we realize that the mountains are literally moving down into our valleys, rivers and bays. Wherefore your memorialists pray that the foregoing statement of facts may receive at your hands that attention its importance demands. Believing that no one industry should be fostered to the utter annihilation of other and paramount interests, therefore be it

Resolved, By the Assembly, the Senate concurring First, that our Senators in Congress are instructed and our Representatives requested to place this memorial before Congress and to press the matters therein mentioned respectfully upon their attention.

Resolved, Second, that our Senators be instructed and our Representatives requested to favor the amendment of the present laws so that no mineral lands shall be disposed of by Congress for the purpose of hydraulic mining, only upon such conditions as shall prevent injury and damage to the valley lands, rivers and bays of our State.

Resolved, Third, that our Senators be instructed and our Representatives requested to urge upon Congress the adoption of such measures and the passage of such laws as shall prevent the destruction of our rivers and bays, and keep them open to that free navigation which is indispensable to our prosperity as a State.

Resolved, Fourth, that our Senators be instructed and our Representatives requested to urge upon Congress the propriety of sending to this coast a competent engineer for the purpose of collecting information as to the extent of hydraulic mining, and the amount of

damage done and likely to be done thereby to our valley lands, rivers and bays, and obtain such other information as may be pertinent to the subject, for the purpose of laying the same before Congress at a subsequent session.

Resolved, Fifth, that his Excellency Governor Irwin be respectfully requested to forward without delay a copy of this memorial and these resolutions to each of our Senators and Representatives in Congress.

Carpenter—I move the reference of this memorial to the Committees on Mining and Agriculture, and that, for the purpose of its consideration, they be made and constituted a select committee.

Berry seconded the motion, which was adopted.

POISONED BY WEARING GUM BOOTS.—The Walla Walla (W. T.) Spirit says: Dan Gillman, an industrious teamster, returned recently from a trip to Boise, dangerously poisoned by the imprudent wearing of gum boots. His whole body was at one time covered with a solid scab, and his suffering on the road was truly heartrending. At one time his life was in jeopardy, but through the assistance of medical aid from Baker City and the kindness of Jo Wadsworth, a fellow-teamster, he was at length enabled to reach this city, and is now fast recovering. Mr. Gillman was severely poisoned in a like manner near Colville about two years ago, and his blood seemed to be still impregnated with impure matter. Gum boots are not to all persons injurious, yet they should be used at all times with due discretion.

THE erection of the new machinery on the Utah mine is nearly completed, and it will not be long now before the pumps will be ready to clear the shaft of water and enable the resumption of work again on the lower levels.

By the fall of a bank in a mining claim near Volcano, Amador county, last week, J. Alamy was instantly killed, and a man named Williams seriously injured.

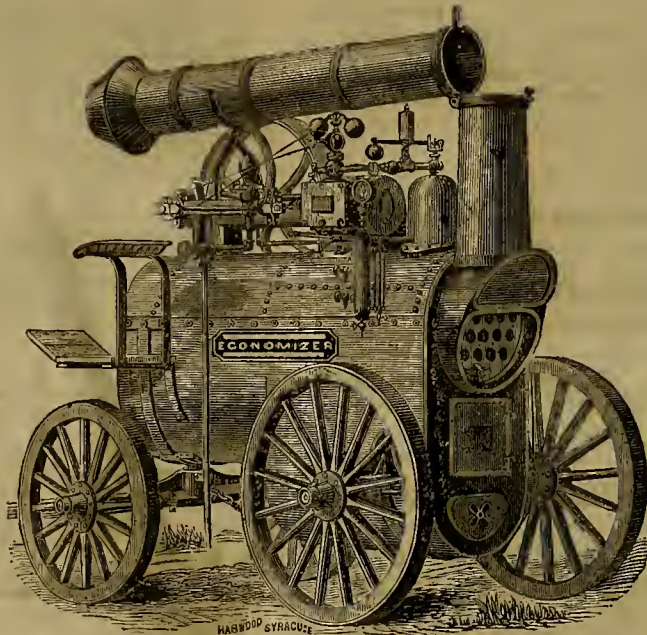
ALTA, Utah, threatens to take out \$5,500,000 worth of gold and silver ore this year.

New Ore Crusher, Grinder and Amalgamator.

Charles Brads, of Copperopolis, Calaveras county, has patented through the agency connected with this office some improvements in crushing, grinding and amalgamating ores. It consists principally in the combination of crushing wheels with a series of drags within a circular track. From this track the pulverized ore is carried into a flume or sluice box containing a series of peculiarly constructed riffles, where it is amalgamated.

The circular grinding track has a suitable surface for the purpose, and made of large diameter. A vertical shaft stands in the center of the elevation within the circle, and to the lower end of this are attached the arms for the attachment of animals for driving the machine. Other arms are arranged to drag the crushing wheels within the track as the arms are driven around. To the arms to which the animals are attached are also fastened the drags which follow the rollers around, and by this combination of rollers and drags the ore is crushed and pulverized to the requisite degree of fineness.

One opening is made at a certain point in the side of the outer rim of the pan which encloses the track, and provided with a suitable screen through which the pulp passes as fast as it becomes fine enough. This pulp, together with sufficient water, is carried by a trough or pipe to the sluice box, into which it falls and passes over the peculiarly constructed riffles. These riffles consist of inclined planes



THE "ECONOMIZER" ENGINE.

which this inventor makes about four feet long by one foot wide, and having a rise of about one inch to the foot. From the top of each incline the water and pulp fall down the abrupt face to the foot of the next plane, and thus through any number of planes. The mercury for amalgamation is placed in the space at the front of each flume, and is partially retained by means of the inclines, but the falling of the water into these spaces as above described is apt to carry some of the valuable metal up the inclines, and it will eventually pass out from the sluice and be lost.

In order to prevent this Mr. Brads employs plates, which are placed across the flumes and stand at an angle, their upper edges being advanced beyond the lower edges. These plates are so placed that the water and pulp fall from the top of each incline into a space between the face and the plate, and all eddies, currents and splashing take place within this space. From this the pulp is forced down through the mercury into which the edge of the plate just dips, and then gently flows up the incline with no tendency to carry off mercury or amalgam. By this device the inventor states that he can save so closely that he is unable to find any trace of mercury or gold in the tailings below the sluice. The sluice may be placed close against the side of the grinder, or, as will be most convenient, it can be set at a short distance away and connected by a pipe or trough so as to leave room for the horse, which drives the crusher, to pass easily. Of course the use of wheels, rollers or drags running in a circular track are not claimed as new, they being commonly used in the Chilean mill and arrastra, both of which are as "old as the hills."

VERY encouraging reports reach us from Central district. All the mines now being worked are looking well. The Teamster, on which work has recently been resumed, is producing the richest kind of ore.

THE Victoria Colonist claims the gold yield of the provinces for 1875 as amounting to \$2,490,026.

The Economizer Portable Engine.

In all the various manufacturing interests of our country, there has long been a want of a simple but effective engine for light work, that can without delay be changed in motion and in amount of power used; saving, at the same time, a proportionate amount of fuel, thus enabling the printer to run on or more presses—the jewelry manufacturer to run on or more machines—the cabinet maker to run on or more lathes—the cheese maker to run part or full capacity—the blacksmith or wagon maker to run on or more forges or machiasses, at proportionate cost for fuel and attention. The "Economizer" is put into the market to fill this want, and is claimed to be very effective in varying supply of fuel to supply of power. The manufacturers use a horizontal boiler, made of heavy boiler iron, having all the merits of a stationary boiler, requiring no mason work, ready for use when shipped, doing away entirely with the dangerous "fire box" and "crown-sheet" of ordinary portable boilers, yet having all their portableness; also having more heating surface than the same size of the common upright boiler.

We give on this page an illustration of the engine applied to agricultural purposes. In our advertising columns is a small portable engine such as we describe. It is placed on top of the boiler, the shaft end of which is bolted on outside of the flue sheet, thus taking off all steam from the boiler, and is also so constructed that, at any time, it can be removed from the boiler and placed upon a sagin foundation, at any point near or remote from the boiler. A prominent feature of the engine is an adjustable cut-off, which can be adjusted without delay, cutting off the steam in the cylinder at any point, and holding it back in the boiler for the next revolution of piston; varying at the same time the strokes of the pump piston, proportionately cutting off the supply of water to the boiler, and enabling the operator to use such amount of power as may be from time to time needed, with proportionate amount of fuel.

The piston rod is of the best English steel, made smaller than of common wrought iron, to equalize steam area on both ends of piston. The piston rings are double steam expanding, presenting a narrow surface for friction—a simple but very effective way of getting rid of the old fashioned piston bolts and set nuts—that are liable (unless adjusted by a machinist) to throw the piston out of the center of the cylinder. Brass stuffing box glands are put in the cylinder head and steam chest, preventing the piston rod and valve stem ever coming in contact with iron; thereby preventing entirely the crasing so often seen in engine piston rods and valve stems, and is a great saving of friction and packing.

The engine bed is cast in trunk shape, the strongest form in which iron can be made; at the same time light and shapely. The pump is attached to the bed instead of to the engine cylinder, which prevents the heating of this pump and valves, which so often renders the working of the pump uncertain. The crank shaft is made of one piece of hammered iron or steel in the strongest form, and runs in Babbitt metal bearings, in boxes that are cast solid on engine bed and cylinder head.

Every engine is furnished with a band pulley, besides the balance wheel, Judson's improved governor, a patent adjustable cut-off, a reliable pump, safety valve, steam gauge, suction and feed pipes, blow-off pipes and cocks, try cocks, glass water gauge, brass check valves, and stop cocks to keep water out of pipes when not running, and to prevent freezing in winter.

The boiler and casing, or arch is made entirely of boiler iron. The heads are made of best flange iron, thoroughly braced. There is a good hand hole, of easy access, to clean the boiler readily. The fire is built as in ordinary stationary boilers, under the front end, the heat passing under the boiler to the back end, and returning through the flues to the front end, escaping through the bonnet cast on the boiler front, into the smoke pipes. By this arrangement is secured the largest amount of heating surface, water and steam room, with the greatest economy of fuel. A wrought iron casing or arch is securely bolted in the center of the boiler, lined with fire tile, thereby preventing loss of heat by radiation, permitting the use of coal, shavings or coarse wood. It is worthy of remark that the feed water pipe is so arranged that water is thrown into the boiler below the flues, thus preventing any danger of explosion, unless the boiler is entirely empty.

A most important advantage is in its being so simplified that an unskilled person can, with directions sent with each machine, operate it with ease and safety. These engines and boilers are made in Syracuse, New York, the agents here being A. L. Fish & Co., Nos. 9 and 11 First street, where they may be examined.

THE Colorado Central lode, near Georgetown, has developed a body of ore, three feet wide, at a depth of 180 feet, a low grade assay of which runs 700 ounces, and adjacent to it another vein has been discovered, which the owners are confident will prove the largest pocket in the Territory.

Lorn Puscasse, of England, has purchased the London mine, in Park county, Colorado, from Ford & Smith, for \$300,000.

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eowbpAt a Stated Term of the Circuit Court
of the United States of America of the Ninth Judicial
Circuit in and for the District of California, held
at the court room in the city and county of San Francisco,
on Thursday, the 30th day of September, in the
year of our Lord one thousand eight hundred and sev-
enty-five. Present—The Honorable Lorenzo Sawyer,
Judge.Nicholas Seibert, complainant, vs. Wm. T. Garratt,
defendant—In equity.

DECEED.

This cause came in to be heard at the February
Term, A. D. 1875, of this Court and was argued by
counsel and thereupon upon consideration thereof, it
was ordered, adjudged and decreed, as follows, viz:
That defendant, William T. Garratt, was not the first
or original inventor, or discoverer of the improvement
or discovery claimed by him, in and by those certain
reissued letters patent of the United States, number
five thousand three hundred and twenty-eight (No.
5328), for an alleged new and useful improvement in
lubricators, issued to said defendant, William T. Gar-
ratt, on the 18th day of March, A. D. 1873, and is not
entitled to a patent therefor, and that said reissued
letters patent, number five thousand three hundred
and twenty-eight (No. 5328) are declared void and the
same are hereby vacated and set aside by reason of their
interference with those certain letters patent of the
United States, number one hundred and eleven thousand
eight hundred and eighty-one (No. 111,881) for a
new and useful improvement in lubricators, issued to
complainant, Nicholas Seibert, on the fourteenth (14th)
day of February, A. D. 1871.It was also further ordered, adjudged and decreed
that complainant do have and recover of and from de-
fendant his costs and expenses to be taxed herein.
(Signed) LORENZO SAWYER,
Circuit Judge.The above decree has reference to "Seibert's Eureka
Lubricator" for oiling the valves and cylinders of
steam engines.It has a glass gauge and condensing pipe, or reser-
voir, with a regulating feed valve, and works as fol-
lows: As the water of condensation is admitted, under
the oil, just so fast the oil passes out at the top through
a pipe into the steam pipe to oil the valves and
cylinder.Parties who infringe or purchase the infringing
lubricators, will be held strictly responsible.N. SEIBERT, Patentee,
125 First Street, S. F.

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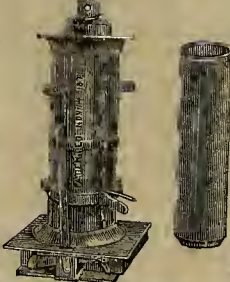
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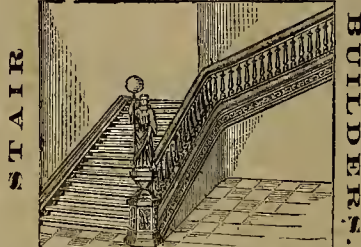
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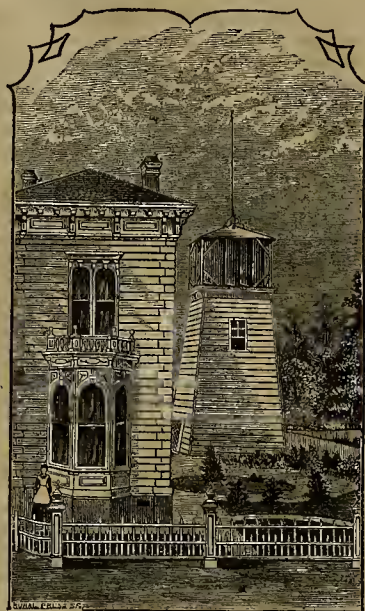
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Will wear three times longer than any iron shoes.

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Of Quartz Mills, Pans, Separators, Concentrators, Jigs, Hydraulic Rock Breakers, Furnaces, Engines, Boilers and Shafting, and General Mining Machinery in all its details, and Furnishers of Mining Supplies. All orders promptly filled.

MOREY & SPERRY,

88 Liberty street, N. Y.

Examination solicited.

The Ingersoll Rock-Drill



Is Extensively Used in the East and

TAKES THE PLACE OF ALL OTHERS,

Wherever introduced, because it can be run with less power, labor and repairs, and do more work than any other drill in the market. It has but few parts, is easily handled, being light, and HAS AUTOMATIC FEED, which saves labor. WE ASK FOR TRIAL AGAINST ANY COMPETITOR. For particular information regarding Drills or Air Compressors, send for circular to

J. B. REYNOLDS,

Room 1, 315 California Street.

MODEL STEAM ENGINES.

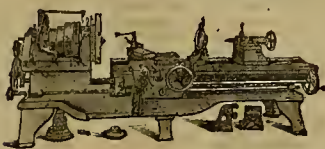
From 50 cents upwards, from Geo. Parr's Unequaled Models of

Steam Cranes, Vertical Engines, Oil-crank Saws, Paddle Engines, Steam Lathes, Steam Hammer, Horizontal " Steam Boilers, Locomotive Engines, Portable " Steam Pumps, Marine Screw " Bean " Steam Winches, Powerful " Electric " Fire Engines, Water Motor " Requires no fuel Upright Engine, Miniature Mach Shop Engines to run with Kerosene Oil or Gas for domestic purposes. Miniature Mechanical and Comical Figures and Saw Mills run by above appliances. Also, Celebrated Amateur's Lathes, Tools and Fittings of every description. Inimitable Castings, for \$1.00 per set and upwards, by means of which numbers of the above Steam Engines, Lathes, &c., have been successfully made by Amateurs. Thousands prove the unparalleled success of the above models and castings.

For full descriptions and prices of the above, together with the requisite tools, see "Parr's Technical Guide," Sec. 1, Eighth edition, Sixty-fifth thousand, over 150 pages with nearly 600 splendid illustrations, giving full instructions in Serrano, Prot Carving and Scull Sawing, and 150 Parlor Experiments in Chemistry, the wonders of Microscopy, the beauties of model Telegraphy, together with other useful and scientific information; also, all necessary instructions how to buy, how to use, and how to make model engines. Post free, 30 Cts. Address GEO. PARR, Manuf'r of Mechanics' Tools, BUFFALO, N. Y.

DUNHAM, CARBON & CO., San Francisco, are Sole Agents in California for my Heavy Wood Working Machinery.

EDWIN HARRINGTON & SON,



Manufacturers of ENGINE LATHES, 48 inches swing and smaller; VERTICAL BORING MACHINES, suitable for jollying and boring Car Wheels; UPRIGHT DRILLS, 36 inches and smaller, and other Machinists' Tools.

COR. NORTH FIFTEENTH ST.

AND PENNSYLVANIA AVENUE,
Philadelphia, Pennsylvania.

STEAM ENGINES & BOILERS

From 3 to 75-horse power. Shafting, Pulleys, Hoist Gears, Quartz Mills, Water Tanks, Spanish A Castles, Pumps and Pipes, Hepburn and Belden Pans, and all kinds of Machinery for sale at lowest prices by

THOS. P. H. WHITELAW,

266 Brannan street, S. F.

Highest cash prices paid for all kinds of Machinery.

Dewey & Co. { 224 { Patent Agt's.

Improved Cast and Forged Steel Shoes and Dies for Quartz Mills.

(PATENTED MAY 26TH, 1874.)

Price Reduced to 16 Cents Per Pound.

SAN FRANCISCO, November 10th, 1874.

To Suppl. of Quartz Mills and Mining Men generally.

We take pleasure in stating that owing to the rapid increase in our orders, our Pittsburgh Manufacturers have been compelled to add largely to their works—a new gas furnace and heavier trip hammer—and are thus enabled to reduce the cost of steel and at the same time produce SHOES AND DIES superior to any yet manufactured. We have consequently reduced the price to 16 cents per pound and solicit a trial order, guaranteeing that you will find them at least 10 per cent cheaper than the best iron. There are no STEEL SHOES AND DIES made excepting under our patent and sold at this office, or by our authorized agents, though certain Eastern manufacturers advertise STEEL SHOES AND DIES which are only cast iron hardened by the addition of a composition. They will not out-wear two sets of common iron, though called steel. They are very brittle and are not capable of being tempered, flying from under the hammer like cast iron. Our STEEL SHOES AND DIES are in use in many of the largest mills on the Pacific Coast, and all who have tried them pronounce them cheaper and far superior to iron in every respect, even at the old price of 20 cents per pound. Their advantages over iron are cheapness of first cost, increased crushing capacity, time saved in changing and in setting tappings, increased value of amalgam by absence of iron dust and chippings, and a saving of 75 per cent. in freight. It takes 50 days to fill orders from the manufactory East. Price 16 cents per pound shipped at San Francisco. Terms liberal.

Address all orders, with dimensions, to W. R. Townsend, Secretary.

1729-3m

CAST STEEL SHOE & DIE CO., Room 4, Academy Building, S F

Tulloch's Automatic Ore Feeder.

WILL FEED WET OR DRY ORE.

REFERS TO

Con. Virginia,	California,	Sumner,
Douglas,	Hite,	Columbus,
Gold Mountain,	Spring Gulch,	Riverside,
Northern Belle,	Leopard,	Panamint,

And many other Mills using them.

F. OGDEN, Sole Agent,

310 California Street, S. F.



THORNE, DeHAVEN & CO.

21st Street, above Market,
PHILADELPHIA.

DRILLING MACHINES.

PORTABLE DRILLS. Driven by power in any direction, self-feed and convenient adjustment.

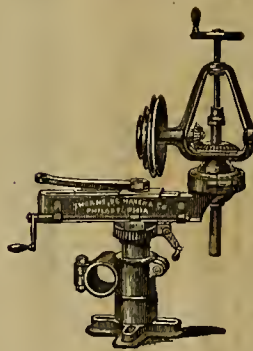
RADIAL DRILLS. Self-feed—large adjustable box table—separate base plate, every convenience.

VERTICAL DRILLS. Self-feeding—of new and improved designs.

MULTIPLE DRILLS. For boiler work, etc., 2 to 20 spindles, fed and returned by power or hand, together or separately.

HORIZONTAL BORING AND DRILLING MACHINES. For large pieces—with boring head, adjustable, vertically and horizontally.

SPECIAL DRILLS. For special work. Gun Blank Drills, Coal Drills, &c., built to order.



AUTOMATIC PUMP.

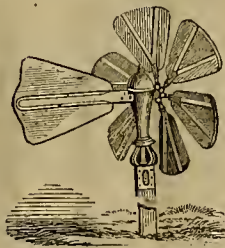
SOMETHING NEW.

RAISES WATER BY COMPRESSED AIR.

SEND FOR CIRCULAR.

J. E. HOLLOWAY, Gen. Agent for Pacific States,

31 Beale Street. San Francisco.



CANDLES.

MITCHELL'S

New York Candles

Full Weight and 14 ounce.

Will be found on comparison to be

Unequaled in Quality.

FOR SALE BY ALL THE LEADING JOBBERS.

14 GMG OZ.

STEARIC ACID
CANDLES
GEO. M. GRANT & CO.
PHILADELPHIA.

Geo. M. Grant & Co., Agents, San Francisco.

Metallurgy and Ores.

JOHN TAYLOR & CO.,

IMPORTERS OF AND DEALERS IN
ASSAYERS' MATERIALS

Chemical Apparatus and Chemicals, Drug-gists Glassware and Sundries, etc.

512 and 518 Washington street, SAN FRANCISCO

We would call the special attention of Assayers Chemists, Mining Companies, Milling Companies, Prospectors, etc., to our large and well adapted stock

ASSAYERS' MATERIALS

—AND—

Chemical Apparatus,

Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast. Our Gold and Silver Tables, showing the value per ounce Troy at different degrees of fineness, and valuable tables for computation of assays in Grains Grammes, will be sent free upon application.

7v15-1f

JOHN TAYLOR & CO.

Nevada Metallurgical Works,

21 First street.....San Francisco.

Ores worked by any process.
Ores sampled.
Assaying in all its branches.
Analysis of Ores, Minerals, Waters, etc.
Plans furnished for the most suitable process for working Ores.
Special attention paid to the Mining and Metallurgy of Quicksilver.

E. HUHN,

C. A. LUCKHARDT,

Mining Engineers and Metallurgists.

RODGERS, MEYER & CO.,

COMMISSION MERCHANTS.

ADVANCES MADE

On all kinds of Ores, and particular attention PAID TO

CONSIGNMENTS OF GOODS.

4v15-3m

Instructions in Assaying,

Chemical Analysis, Determination of Minerals, and use of the Blow-pipe.

HENRY G. HANKS

Will receive a few pupils at his new laboratory, 617 Montgomery street, up-stairs. TERMS MODERATE

LEOPOLD KUH,

(Formerly of the U. S. Branch Mint, S. F.)

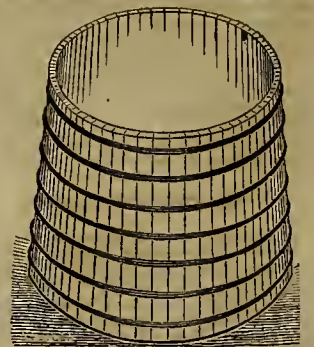
Assayer and Metallurgical CHEMIST,

No. 611 Commercial Street,

(Opposite the U. S. Branch Mint.

SAN FRANCISCO CAL.

7v21-3m



WATER TANKS of any capacity, made entirely by machinery. Material the best in use; construction not excelled. Attention, dispatch, satisfaction. Cost less than elsewhere.

WELLS, RUSSELL & CO.,

Mechanics' Mills, Cor. Mission & Fremont Streets.

3v23-3m-2a

Diamond Drill Co.

The undersigned, owners of LESCHOT'S PATENT for DIAMOND POINTED DRILLS, now brought to the highest state of perfection, are prepared to fill orders for the IMPROVED PROSPECTING and TUNNELING DRILLS, with or without power, at short notice, and at reduced prices. Abundant testimony furnished of the great economy and successful working of numerous machines in operation in the quartz and gravel mines on this coast. Circulars forwarded, and full information given upon application.

A. J. SEVERANOE & CO.,

Office, No. 315 California street, Rooms 1 and 2.

2v728-1f

PATENTS & INVENTIONS.

A Weekly List of U. S. Patents Issued to Pacific Coast Inventors.

FROM OFFICIAL REPORTS FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.

By Special Dispatch, Dated Washington, D. C., Jan 11th, 1876.

FOR WEEK ENDING DECEMBER 28th, 1875.*

PADLOCK.—Geo. R. Cutbirth, S. F., Cal.
BOOTS AND SHOES.—William Biddle, Corvallis, Oregon.

PROCESS OF LEVELING LAND.—Thomas R. Lowe, Centerville, Cal.

*The patents are not ready for delivery by the Patent Office until some 14 days after the date of issue. NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

"TRADE TUITION."—On Saturday evening, A. S. Hallidie, President of the Mechanical Institute, delivered the inaugural lecture of the course under the auspices of the University and the Institute. The subject, as previously announced, was "Trade Tuition." The progress of technical education in the United States and in the most enlightened countries of Europe was reviewed. The labors of the Art Association in this city in the establishment by it of a School of Design were complimentarily referred to. James Lick's beneficence in giving so liberally toward the founding of a School of Mechanic Arts was eulogized, and the unity of action between the Lick and Horace Hawes Chamber of Industry trusts urgently recommended, which the speaker believed would go far toward bringing about a solution of the problem of trade tuition in this city.

New Incorporations.

The following companies have filed certificates of incorporation in the County Clerk's Office at San Francisco:

SERVIA AND SLAVONIA M. Co.—January 8th. Location: Delano district, Elko county, Nevada. Directors—Wm. Holden, Henry P. Irving, John Garber, Charles E. Abbott and Samuel A. Morrison. Capital stock, \$100,000.

RISEING STAR G. & S. M. Co.—January 9th. Location: Garden Valley mining district, El Dorado county, California. Directors—George A. Gates, R. A. Wilson, J. W. Nye, P. H. Blake and C. C. Brookings. Capital stock, \$50,000.

MOUNT WASHINGTON S. M. Co.—January 9th. Location: California. Directors—John Banham, A. J. Kerslake, Wm. Jones, John A. Ransom and Charles W. Randall. Capital stock, \$40,000.

NORTH SIERRA NEVADA S. M. Co.—Location: Nevada. Directors—George W. Fisher, Charles E. Pearson, Daniel M. Seaton, A. J. Adams and John Ward. Capital stock, \$100,000.

LIVERPOOL G. & S. M. Co.—January 1st. Location: State of Nevada. Capital stock, \$50,000. Directors—C. M. Pease, Samuel Purdy, Robert J. Tobin, Samuel P. Middleton and George E. Sharp.

LONDON M. & M. Co.—Jan 7th. Location: State of Nevada. Capital stock, \$5,000. Directors—Wm. O. Pease, Samuel Purdy, R. J. Tobin, S. P. Middleton and G. E. Sharp.

MINDELEFF REDUCTION CO.—Jan 7th. Object, to mine for or to purchase and reduce copper or other ores, and to license to the Mindeleff process, United States letters patent, release, No. 6,509, on the royalty or any other system conducive to the welfare of the company. Directors—T. H. Alexander, L. L. Robinson, Demiry Mindeleff, James R. Smedberg, John Cornwell, J. Morgan and E. de F. Curtis. Capital stock, \$50,000. Wm. described the details of this process in a recent number of the Press.

CALIFORNIA SCHOOL OF MECHANICAL ARTS.—Jan. 10th. Object: To found, control and manage an institution to educate males and females in the practical arts of life, such as in wood, iron, stone or any of the metals, and in whatever industry intelligent mechanical skill now is, or can hereafter be applied; the institution to be open to all males or females born in California. Directors—J. D. B. Stillman, Horace Davis, A. S. Hallidie, John O. Eldridge, Lorenzo Sawyer, Horatio Stebbins and Wm. Aschburner. Capital stock, none mentioned. This is to be the institution provided for by Mr. James Lick. The gentlemen named by Mr. Lick to take charge of the matter met on the 8th inst., and elected those mentioned as Trustees of the Institute.

Meetings and Elections.

SAN FRANCISCO STOCK AND EXCHANGE BOARD.—James W. Coleman, President; C. W. Bonyage, Vice President; B. Howard Coit, Chairman; Henry Schmeddel, Treasurer; Franklin Lawton, Secretary; Thomas M. Blair, Sergeant-at-Arms.

PACIFIC STOCK EXCHANGE.—E. J. Baldwin, President; George S. Dodge, Vice President; Joseph Tilden, Chairman; George O. Hickox, Treasurer; A. J. Moulder, Secretary.

WASHINGTON G. M. Co.—Trustees: Richard H. Stretch (President), Thomas Wallace (Secretary), S. J. Corbett, Henry Sumner, and Merchants' Exchange Bank, Treasurer.

EMERSON CONSOLIDATED M. Co.—Trustees: H. B. Cogdon (President), W. C. Guirey (Secretary), Sias Sellick (Vice President), E. H. Rogers and H. F. Morris.

WEBSTER M. Co.—Trustees: Amos Roddy (President), W. S. Hopkins (Treasurer), E. Caldwell (Vice President), F. G. Berry, J. Scott Wilson (Secretary), R. P. Hosmer.

GILA M. Co.—Directors: A. K. Hawkins, Camilo Martin, J. M. English, J. B. McGee and K. Cohn. This company has been in trouble lately as some of the stockholders endeavoring to oust the trustees, who, however, were re-elected. On Monday the annual meeting of stockholders was held in the company's office in the Nevada block. The number of votes polled was 88,634. The present management received out of this number 60,624 votes against 23,494 for the opposition.

It is said that within the past few days the friends of the management took into the office enough shares to make up 32,000, thus enabling them to have a majority. The 8,624 in excess of the 62,000—making the 62,524 voted—were then all that the management had previously in its possession.

HUMBOLDT M. Co.—Trustees: A. Untz, J. Ginnace, G. B. Berry (President), D. Hardy and R. H. Brown (Secretary).

METALS.

[WHOLESALE.]

WEDNESDAY M., January 12, 1876.

American Pig Iron, 30 ton	38 00	@	35 00
Scotch Pig Iron, 30 ton	35 00	@	37 00
White Pig, 30 ton	35 00	@	38 00
Oregon Pig, 30 ton	35 00	@	40 00
Refined Bar, bad assortment, 30 lb	24 00	@	25 00
Refined Bar, good assortment, 30 lb	24 00	@	25 00
Boiler, No. 1 to 4	10 00	@	12 00
Plate, No. 5 to 8	10 00	@	12 00
Sheet, No. 10 to 14	10 00	@	12 00
Sheet, No. 16 to 20	10 00	@	12 00
Sheet, No. 22 to 24	10 00	@	12 00
Sheet, No. 26 to 28	10 00	@	12 00
Horse Shoes, per keg	6 50	@	8 00
Nail Rod	10 00	@	12 00
Navy Iron	10 00	@	12 00
Roller Iron	10 00	@	12 00
Other Irons for Blacksmiths, Miners, etc.	10 00	@	12 00
COPPER			
Brass	35 00	@	38 00
Copper Tin	35 00	@	38 00
O'Neil's Pat.	35 00	@	38 00
Sheathing, Yellow	24 00	@	25 00
Sheathing, Old Yellow	24 00	@	25 00
Composition Bolts	24 00	@	25 00
Steel English Cast, 30 lb	20 00	@	22 00
Anderson & Woods' American Cast	20 00	@	22 00
Drill	18 00	@	20 00
File	18 00	@	20 00
Flow Stop	9 00	@	10 00
TIN PLATES			
10x14 O Charcoal	10 50	@	11 00
10x14 X Charcoal	12 50	@	13 00
Roofing Plate O Charcoal	10 00	@	10 50
Ranches Tin	26 00	@	28 00
Australian	18 00	@	20 00
Zinc			
10x10 Sheet 7x3 ft, No 7 to 10 lb	10 00	@	11 00
do do 7x3 ft, No 11 to 14	10 00	@	11 00
do do 8x4 ft, No 8 to 10	10 00	@	11 00
do do 8x4 ft, No 11 to 14	10 00	@	11 00
NAILS Assorted sizes	3 00	@	3 75
WIRE SILVER, per lb	72 00	@	75 00

LEATHER.

[WHOLESALE.]

WEDNESDAY M., January 12, 1876.

City Tanned Leather, 30 lb	22 00	@	22 25
Santa Cruz Leather, 30 lb	22 00	@	22 25
Country Leather, 30 lb	22 00	@	22 25
Stocking Leather, 30 lb	22 00	@	22 25
Jodot, 8 Kil, per doz	55 00	@	54 00
Jodot, 11 to 13 Kil, per doz	55 00	@	54 00
Jodot, 14 to 16 Kil, per doz	55 00	@	54 00
Jodot, 17 to 19 Kil, per doz	55 00	@	54 00
Jodot, 20 Kil, per doz	55 00	@	54 00
Cornelian, 12 to 16 Kil	57 00	@	57 00
Cornelian Females, 12 to 13 Kil	57 00	@	57 00
Cornelian Females, 14 to 15 Kil	57 00	@	57 00
Simon Ulmo Females, 12 to 13 Kil	57 00	@	57 00
Simon Ulmo Females, 14 to 15 Kil	57 00	@	57 00
Simon Ulmo Females, 16 to 17 Kil	57 00	@	57 00
Simon, 18 Kil, 30 doz	57 00	@	57 00
Simon, 20 Kil, 30 doz	57 00	@	57 00
Simon, 22 Kil, 30 doz	57 00	@	57 00
Robert, 24 Kil, 30 doz	57 00	@	57 00
French Sheep, all colors, 30 doz	40 00	@	40 00
Eastern Calf for Backs, 30 doz	1 00	@	1 25
Good French Calf Boot Legs, 30 doz	5 00	@	5 25
Sheep Boats for Linings, 30 doz	5 00	@	5 25
California Ranges Sheep Linings	1 75	@	4 00
Best Jodot Calf Boot Legs, 30 doz	5 00	@	5 25
Good French Calf Boot Legs, 30 doz	5 00	@	5 25
French Calf Boot Legs, 30 doz	4 00	@	4 25
Harness Leather, 30 doz	24 00	@	24 25
Fair Bridle Leather, 30 doz	48 00	@	48 25
Wet Leather, 30 doz	30 00	@	30 25
Snuff Leather, 30 doz	17 00	@	17 25
Wax Side Leather, 30 doz	17 00	@	17 25

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by CHARLES SUTRO & CO.]

SAN FRANCISCO, January 12, 3 P. M.

LEGAL TENDERS in S. F., 11 A. M., 83 1/2 to 84 1/2.	
GOLD in N. Y. 112 1/2.	
GOLD BARS, 800 @ 90. SILVER BARS, 7 1/2 and 8 per cent discount.	
EXCHANGE ON N. Y., 60-100 per cent premium for gold; on London bankers, 49; Commercial, 49 1/2; Paris, five francs per dollar; Mexico, dollars, three to five per cent discount.	
LONDON — Consols, 33 to 34 1/2; Bonds, 102 1/2.	
QUOTATIONS in S. F., by the bank, per lb, 12 1/2 @ 12 5/8.	

Do not rely Providence by neglecting a chronic cough cold, when the certain antidote to these dangers is supplied by HALL'S COUGH OR HOARSENESS CURE. This is obtained at every drug store in America. Pike's Toothache Drops cure in one minute.

Mining and Other Companies.

Cherokee Flat Blue Gravel Company.

Location of principal place of business, San Francisco, Cal. Location of works, Cherokee Flat, Butte County, Cal.

Notice is hereby given, that at a meeting of the Board of Directors, held on the twenty-eighth day of December, 1875, an assessment, No. 25, of five cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the company, room 13, Safe Deposit Building, No. 28 Montgomery street, San Francisco, Cal.

Any stock upon which said assessment shall remain unpaid on the twenty-ninth day of January, 1876, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Saturday, the nineteenth day of February, 1876, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

O. H. BOGART, Secretary.

Office, room 13, No. 323 Montgomery street, San Francisco, Cal.

Mariposa Land and Mining Company of California.

Location of works, Mariposa county, California.

NOTICE.—There is delinquent upon the following described stock, on account of assessment (No. 3), levied on the 30th day of November, 1875, the several amounts set opposite the names of the respective shareholders, as follows:

COMMON STOCK.

Names.	No. Certificate.	No. Shares.	Amount.
Alexander, J. B.	unissued	100	\$100 00
Arnold, W. H.	423	25	25 00
Adams, Thomas	428	55	55 00
Brumagim, J. H.	unissued	4200	4200 00
Brumagim, J. H.	426	25	25 00
Brumagim, J. H.	427	25	25 00
Bennett, N. R.	unissued	100	100 00
Brumagim, Mark	433	1	1 00
Bullock, A. George	unissued	100	100 00
Bound & Co.	unissued	800	800 00
Briggs, Edwin	unissued	100	100 00
Bogert, Jas C.	unissued	100	100 00
Badcock, J. J.	84	100	100 00
Badcock, J. J.	85	100	100 00
Cody, Edmund	unissued	50	50 00
Crowford, Geo R.	unissued	100	100 00
Cowp, J. L.	unissued	100	100 00
Castellano, A V & Co.	60	100	100 00
Castellano, A V & Co.	61	100	100 00
Castellano, A V & Co.	62	100	100 00
Castellano, A V & Co.	63	100	100 00
Castellano, A V & Co.	64	100	100 00
Castellano, A V & Co.	65	100	100 00
Curlis, W. B.	272	100	100 00
Dunnell, T. L.	unissued	26	25 00

Names.	No. Certificate.	No. Shares.	Amount.	Names.	No. Certificate.	No. Shares.	Amount.
Durhrow, Lamont.....	unissued	200	200 00	Rathborne, R Wm.....	194	100	100 00
Delavan, O. J.....	278	100	100 00	Rathborne, R Wm.....	195	100	100 00
English, Wm.....	unissued	50	50 00	Rathborne, R Wm.....	196	100	100 00
Elsten, W. A.....	unissued	1350	1350 00	Rathborne, R Wm.....	197	100	100 00
Flanoran, H. H.....	unissued	200	200 00	Rathborne, R Wm.....	198	100	100 00
Fries, Chas.....	unissued	200	200 00	Rathborne, R Wm.....	199	100	100 00
Furness, J. W.....	unissued	50	50 00	Rathborne, R Wm.....	200	100	100 00
Furham, Geo G.....	unissued	100	100 00	Rathborne, R Wm.....	201	100	100 00
Ferguson, Yates.....	33	100	100 00	Rathborne, R Wm.....	202	100	100 00
Fisk & Hatch.....	31	100	100 00	Rathborne, R Wm.....	203	100	100 00
Frim, John F.....	436	1	1 00	Rathborne, R Wm.....	206	100	100 00
Gavater, J. A.....	44	100	100 00	Rathborne, R Wm.....	211	100	100 00
Glendenning, Davis & Amory.....	46	100	100 00	Rathborne, R Wm.....	212	100	100 00
Glendenning, Davis & Amory.....	47	100	100 00	Rathborne, R Wm.....	213	100	100 00
Glendenning, Davis & Amory.....	239	100	100 00	Rathborne, R Wm.....	215	100	100 00
Glendenning, Davis & Amory.....	290	100	100 00	Rathborne, R Wm.....	216	100	100 00
Glendenning, Davis & Amory.....	291	100	100 00	Rathborne, R Wm.....	217	100	100 00
Glendenning, Davis & Amory.....	292	100	100 00	Rathborne, R Wm.....	218	100	100 00
Glendenning, Davis & Amory.....	293	100	100 00	Rathborne, R Wm.....	219	100	100 00
Glendenning, Davis & Amory.....	294	100	100 00	Rathborne, R Wm.....	221	100	100 00
Glendenning, Davis & Amory.....	295	100	100 00	Rathborne, R Wm.....	222	100	100 00
Glendenning, Davis & Amory.....	296	100	100 00	Rathborne, R Wm.....	223	100	100 00
Glendenning, Davis & Amory.....	297	100	100 00	Rathborne, R Wm.....	224	100	100 00
Glendenning, Davis & Amory.....	298	100	100 00	Rathborne, R Wm.....	225	100	100 00
Glendenning, Davis & Amory.....	299	100	100 00	Rathborne, R Wm.....	226	100	100 00
Glendenning, Davis & Amory.....	300	100	100 00	Rathborne, R Wm.....	227	100	100 00
Glendenning, Davis & Amory.....	301	100	100 00	Rathborne, R Wm.....	228	100	100 00
Glendenning, Davis & Amory.....	302	100	100 00	Rathborne, R Wm.....	229	100	100 00
Glendenning, Davis & Amory.....	303	100	100 00	Rathborne, R Wm.....	230	100	100 00
Glendenning, Davis & Amory.....	304	100	100 00	Rathborne, R Wm.....	231	100	100 00
Glendenning, Davis & Amory.....	305	100	100 00	Rathborne, R Wm.....	232	100	100 00
Glendenning, Davis & Amory.....	306	100	100 00	Rathborne, R Wm.....	233	100	100 00
Glendenning, Davis & Amory.....	307	100	100 00	Rathborne, R Wm.....	234	100	100 00
Glendenning, Davis & Amory.....	308	100	100 00	Rathborne, R Wm.....	235	100	100 00
Glendenning, Davis & Amory.....	309	100	100 00	Rathborne, R Wm.....	236	100	100 00
Glendenning, Davis & Amory.....	310	100	100 00	Rathborne, R Wm.....	237	100	100 00
Glendenning, Davis & Amory.....	311	100	100 00	Rathborne, R Wm.....	238	100	100 00
Glendenning, Davis & Amory.....	312	100	100 00	Rathborne, R Wm.....	239	100	100 00
Glendenning, Davis & Amory.....	313	100	100 00	Rathborne, R Wm.....	240	100	100 00
Glendenning, Davis & Amory.....	314	100	100 00	Rathborne, R Wm.....	241	100	100 00
Glendenning, Davis & Amory.....	315	100	100 00	Rathborne, R Wm.....	242	100	100 00
Glendenning, Davis & Amory.....	316	100	100 00	Rathborne, R Wm.....	243	100	100 00
Glendenning, Davis & Amory.....	317	100	100 00	Rathborne, R Wm.....	244	100	100 00
Glendenning, Davis & Amory.....	318	100	100 00	Rathborne, R Wm.....	245	100	100 00
Glendenning, Davis & Amory.....	319	100	100 00	Rathborne, R Wm.....	246	100	100 00
Glendenning, Davis & Amory.....	320	100	100 00	Rathborne, R Wm.....	247	100	100 00
Glendenning, Davis & Amory.....	321	100	100 00	Rathborne, R Wm.....	248	100	100 00
Glendenning, Davis & Amory.....	322	100	100 00	Rathborne, R Wm.....	249	100	100 00
Glendenning, Davis & Amory.....	323	100	100 00	Rathborne, R Wm.....	250	100	100 00
Glendenning, Davis & Amory.....	324	100	100 00	Rathborne, R Wm.....	251	100	100 00
Glendenning, Davis & Amory.....	325	100	100 00	Rathborne, R Wm.....	252	100	100 00
Glendenning, Davis & Amory.....	326	100	100 00	Rathborne, R Wm.....	253	100	100 00
Glendenning, Davis & Amory.....	327	100	100 00	Rathborne, R Wm.....	254	100	100 00
Glendenning, Davis & Amory.....	328	100	100 00	Rathborne, R Wm.....	255	100	100 00
Glendenning, Davis & Amory.....	329	100	100 00	Rathborne, R Wm.....	256	100	100 00
Glendenning, Davis & Amory.....	330	100	100 00	Rathborne, R Wm.....	257	100	100 00
Glendenning, Davis & Amory.....	331	100	100 00	Rathborne, R Wm.....	258	100	100 00
Glendenning, Davis & Amory.....	332	100	100 00	Rathborne, R Wm.....	259	100	100 00
Glendenning, Davis & Amory.....	333	100	100 00	Rathborne, R Wm.....	260	100	100 00
Glendenning, Davis & Amory.....	334	100	100 00	Rathborne, R Wm.....	261	100	100 00
Glendenning, Davis & Amory.....	335	100	100 00	Rathborne, R Wm.....	262	100	100 00
Glendenning, Davis & Amory.....	336	100	100 00	Rathborne, R Wm.....	263	100	100 00
Glendenning, Davis & Amory.....	337	100	100 00	Rathborne, R Wm.....	264	100	100 00
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Glendenning, Davis & Amory.....	339	100	100 00	Rathborne, R Wm.....	266	100	100 00
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Glendenning, Davis & Amory.....	341	100	100 00	Rathborne, R Wm.....	268	100	100 00
Glendenning, Davis & Amory.....	342	100	100 00	Rathborne, R Wm.....	269	100	100 00
Glendenning, Davis & Amory.....	343	100	100 00	Rathborne, R Wm.....	270	100	100 00
Glendenning, Davis & Amory.....	344	100	100 00	Rathborne, R Wm.....	271	100	100 00
Glendenning, Davis & Amory.....	345	100	100 00	Rathborne, R Wm.....	272	100	100 00
Glendenning, Davis & Amory.....	346	100	100 00	Rathborne, R Wm.....	273	100	100 00
Glendenning, Davis & Amory.....	347	100	100 00	Rathborne, R Wm.....	274	100	100 00
Glendenning, Davis & Amory.....	348	100	100 00	Rathborne, R Wm.....	275	100	100 00
Glendenning, Davis & Amory.....	349	100	100 00	Rathborne, R Wm.....	276	100	100 00
Glendenning, Davis & Amory.....	350	100	100 00	Rathborne, R Wm.....	277	100	100 00
Glendenning, Davis & Amory.....	351	100	100 00	Rathborne, R Wm.....	278	100	100 00
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Glendenning, Davis & Amory.....	353	100	100 00	Rathborne, R Wm.....	280	100	100 00
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Glendenning, Davis & Amory.....	355	100	100 00	Rathborne, R Wm.....	282	100	100 00
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Glendenning, Davis & Amory.....	358	100	100 00	Rathborne, R Wm.....	285	100	100 00
Glendenning, Davis & Amory.....	359	100	100 00	Rathborne, R Wm.....	286	100	100 00
Glendenning, Davis & Amory.....	360	100	100 00	Rathborne, R Wm.....	287	100	100 00
Glendenning, Davis & Amory.....	361	100	100 00	Rathborne, R Wm.....	288	100	100 00
Glendenning, Davis & Amory.....	362	100	100 00	Rathborne, R Wm.....	289	100	100 00
Glendenning, Davis & Amory.....	363	100	100 00	Rathborne, R Wm.....	290	100	100 00
Glendenning, Davis & Amory.....	364	100	100 00	Rathborne, R Wm.....	291	100	100 00
Glendenning, Davis & Amory.....	365	100	100 00	Rathborne, R Wm.....	292	100	100 00
Glendenning, Davis & Amory.....	366	100	100 00	Rathborne, R Wm.....	293	100	100 00
Glendenning, Davis & Amory.....	367	100	100 00	Rathborne, R Wm.....	294	100	100 00
Glendenning, Davis & Amory.....	368	100	100 00	Rathborne, R Wm.....	295	100	100 00
Glendenning, Davis & Amory.....	369	100	100 00	Rathborne, R Wm.....	296	100	100 00
Glendenning, Davis & Amory.....	370	100	100 00	Rathborne, R Wm.....	297	100	100 00
Glendenning, Davis & Amory.....	371	100	100 00	Rathborne, R Wm.....	298	100	100 00
Glendenning, Davis & Amory.....	372	100	100 00	Rathborne, R Wm.....	299	100	100 00
Glendenning, Davis & Amory.....	373	100	100 00	Rathborne, R Wm.....	300	100	100 00
Glendenning, Davis & Amory.....	374	100	100 00	Rathborne, R Wm.....	301	100	100 00
Glendenning, Davis & Amory.....	375	100	100 00	Rathborne, R Wm.....	302	100	100 00
Glendenning, Davis & Amory.....	376	100	100 00	Rathborne, R Wm.....	303	100	100 00
Glendenning, Davis & Amory.....	377	100	100 00	Rathborne, R Wm.....	304	100	100 00
Glendenning, Davis & Amory.....	378	100	100 00	Rathborne, R Wm.....	305	100	100 00
Glendenning, Davis & Amory.....	379	100	100 00	Rathborne, R Wm.....	306	100	100 00
Glendenning, Davis & Amory.....	380	100	100 00	Rathborne, R Wm.....	307	100	100 00
Glendenning, Davis & Amory.....	381	100	100 00	Rathborne, R Wm.....	308	100	100 00
Glendenning, Davis & Amory.....	382	100	100 00	Rathborne, R Wm.....	309	100	100 00
Glendenning, Davis & Amory.....	383	100	100 00	Rathborne, R Wm.....	310	100	100 00
Glendenning, Davis & Amory.....	384	100	100 00	Rathborne, R Wm.....	311	100	100 00
Glendenning, Davis & Amory.....	385	100	100 00	Rathborne, R Wm.....	312	100	100 00
Glendenning, Davis & Amory.....	386	100	100 00	Rathborne, R Wm.....	313	100	100 00
Glendenning, Davis & Amory.....	387	100	100 00	Rathborne, R Wm.....	314	100	100 00
Glendenning, Davis & Amory.....	388	100	100 00	Rathborne, R Wm.....	315	100	100 00
Glendenning, Davis & Amory.....	389	100	100 00	Rathborne, R Wm.....	316	100	100 00
Glendenning, Davis & Amory.....	390	100	100 00	Rathborne, R Wm.....	317	100	100 00
Glendenning, Davis & Amory.....	391	100	100 00	Rathborne, R Wm.....	318	100	100 00
Glendenning, Davis & Amory.....	392	100	100 00	Rathborne, R Wm.....	319	100	100 00
Glendenning, Davis & Amory.....	393	100	100 00	Rathborne, R Wm.....	320	100	100 00
Glendenning, Davis & Amory.....	394	100	100 00	Rathborne, R Wm.....	321	100	100 00
Glendenning, Davis & Amory.....	395	100	100 00	Rathborne, R Wm.....	322	100	100 00
Glendenning, Davis & Amory.....	396	100	100 00	Rathborne, R Wm.....	323	100	100 00
Glendenning, Davis & Amory.....	397	100	100 00	Rathborne, R Wm.....	324	100	100 00
Glendenning, Davis & Amory.....	398	100	100 00	Rathborne, R Wm.....	325	100	100 00
Glendenning, Davis & Amory.....	399	100	100 00	Rathborne, R Wm.....	326	100	100 00
Glendenning, Davis & Amory.....	400	100	100 00	Rathborne, R Wm.....	327	100	100 00
Glendenning, Davis & Amory.....	401	100	100 00	Rathborne, R Wm.....	328	100	100 00
Glendenning, Davis & Amory.....	402	100	100 00	Rathborne, R Wm.....	329	100	100 00
Glendenning, Davis & Amory.....	403	100	100 00	Rathborne, R Wm.....	330	100	100 00
Glendenning, Davis & Amory.....	404	100	100 00	Rathborne, R Wm.....	331	100	100 00
Glendenning, Davis & Amory.....	405	100	100 00	Rathborne, R Wm.....	332	100	100 00
Glendenning, Davis & Amory.....	406	100	100 00	Rathborne, R Wm.....	333	100	100 00
Glendenning, Davis & Amory.....	407	100	100 00	Rathborne, R Wm.....	334	100	100 00
Glendenning, Davis & Amory.....	408	100	100 00	Rathborne, R Wm.....	335	100	100 00
Glendenning, Davis & Amory.....	409	100	100 00	Rathborne, R Wm.....	336	100	100 00
Glendenning, Davis & Amory.....	410	100	100 00	Rathborne, R Wm.....	337	100	100 00
Glendenning, Davis & Amory.....	411	100	100 00	Rathborne, R Wm.....	338	100	100 00
Glendenning, Davis & Amory.....	412	100	100 00	Rathborne, R Wm.....	339	100	100 00
Glendenning, Davis & Amory.....	413	100	100 00	Rathborne, R Wm.....	340	100	100 00
Glendenning, Davis & Amory.....	414	100	100 00	Rathborne, R Wm.....	341	100	100 00
Glendenning, Davis & Amory.....	415	100	100 00	Rathborne, R Wm.....	342	100	100 00
Glendenning, Davis & Amory.....	416	100	100 00	Rathborne, R Wm.....	343	100	100 00
Glendenning, Davis & Amory.....	417	100	100 00	Rathborne, R Wm.....	344	100	100 00
Glendenning, Davis & Amory.....	418	100	100 00	Rathborne, R Wm.....	345	100	100 00
Glendenning, Davis & Amory.....							

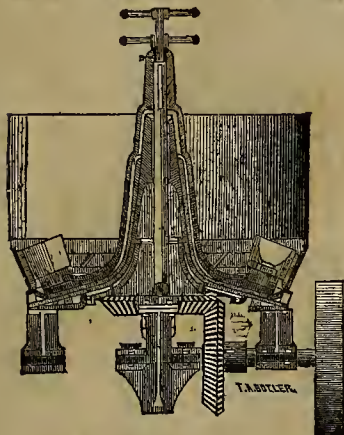
Names.	No. Certificate.	No. Shares.	Amount.
Shaw, Prosper P. Trustee.....	20	100	100 00
Shaw, Prosper P. Trustee.....	21	100	100 00
Shaw, Prosper P. Trustee.....	22	100	100 00
Shaw, Prosper P. Trustee.....	23	100	100 00
Shaw, Prosper P. Trustee.....	24	100	100 00
Shaw, Prosper P. Trustee.....	25	100	100 00
Shaw, Prosper P. Trustee.....	26	100	100 00
Block, Henry.....	420	63	63 00
Block, Henry.....	421	6	6 00
Block, Henry.....	419	67	67 00
Block, Henry.....	423	1	1 00
Cheabrough, Mrs Sarah D.....	unissued	135	135 00
Cutting, R L Jr & Co.....	33	100	100 00
Cutting, R L Jr & Co.....	34	100	100 00
Cutting, R L Jr & Co.....	411	35	35 00
Cutting, R L Jr & Co.....	412	35	35 00
Clarke, Wm M.....	unissued	47	47 00
Caldwell, Geo.....	unissued	551	551 00
Crawford, Geo R.....	unissued	230	230 00
Cummings, Wm L.....	unissued	105	105 00
Connett, W H.....	unissued	214	214 00
Connett, W H.....	123	100	100 00
Connett, W H.....	133	100	100 00
Connett, W H.....	434	35	35 00
Collins, C A.....	100	100	100 00
Collins, C A.....	106	100	100 00
Collins, C A.....	111	100	100 00
Collins, C A.....	112	100	100 00
Collins, C A.....	113	100	100 00
Collins, C A.....	114	100	100 00
Collins, C A.....	117	100	100 00
Collins, C A.....	118	100	100 00
Collins, C A.....	119	100	100 00
Collins, C A.....	120	100	100 00
Collins, C A.....	121	100	100 00
Collins, C A.....	122	100	100 00
Collins, C A.....	123	100	100 00
Collins, C A.....	124	100	100 00
Collins, C A.....	125	100	100 00
Cootes, F B.....	435	76	76 00
Dunsmuir, O G.....	unissued	27	27 00
Dunsmuir, O G.....	unissued	270	270 00
Downing, Augustus.....	unissued	79	79 00
Denon, P H.....	unissued	100	100 00
Denon, P H.....	unissued	67	67 00
De Grays, Quincy C.....	unissued	100	100 00
Delano, Edward.....	51	100	100 00
Delano, Edward.....	52	100	100 00
Delano, Edward.....	53	100	100 00
Elgenbrodt, Wm E.....	unissued	15	15 00
Eaton, Elfrath D.....	unissued	15	15 00
Elgenbrodt, Sallie.....	unissued	17	17 00
Elgenbrodt, David L.....	unissued	32	32 00
Ford, Augustus.....	unissued	270	270 00
Ferguson, Clement.....	unissued	147	147 00
Foster, C M Jr.....	unissued	200	200 00
Flanoran, W H.....	unissued	100	100 00
Francis, H M Atty.....	25	100	100 00
Francis, H M Atty.....	26	100	100 00
Francis, H M Atty.....	27	100	100 00
Francis, H M Atty.....	28	100	100 00
Francis, H M Atty.....	403	50	50 00
Falmer, H J.....	29	100	100 00
Grider, Chas D.....	unissued	70	70 00
Gelston & Budding.....	unissued	405	405 00
Greenleaf, Morris & Co.....	429	10	10 00
Greenleaf, Morris & Co.....	431	35	35 00
Greenleaf, Morris & Co.....	75	100	100 00
Greenleaf, Morris & Co.....	76	100	100 00
Greenleaf, Morris & Co.....	77	100	100 00
Greenleaf, Morris & Co.....	78	100	100 00
Greenleaf, Morris & Co.....	79	100	100 00
Greenleaf, Morris & Co.....	80	100	100 00
Greenleaf, Morris & Co.....	81	100	100 00
Greenleaf, Morris & Co.....	82	100	100 00
Greenleaf, Morris & Co.....	83	100	100 00
Howard, John P.....	unissued	281	281 00
Heineman, Payson & Morgan.....	unissued	79	79 00
Hadden, Crowell.....	unissued	173	173 00
Hadden, Crowell.....	unissued	800	800 00
Hay & Warner.....	unissued	2	2 00
Huston, H L.....	unissued	100	100 00
Hadden & Co.....	unissued	45	45 00
Hadden & Co.....	417	35	35 00
Hadden, W A.....	45	100	100 00
Hadden, W A.....	47	100	100 00
Hadden, W A.....	48	100	100 00
Hadden, W A.....	49	100	100 00
Hadden, W A.....	50	100	100 00
Hadden, W A.....	418	63	63 00
Hartot & Meryes.....	unissued	1037	1037 00
Hay, Frank.....	unissued	325	325 00
Hart, J.....	unissued	20	20 00
Hoyt, Adana A.....	428	14	14 00
Howe, Henry A.....	35	100	100 00
Howe, Henry A.....	36	100	100 00
Howe, Henry A.....	37	100	100 00
Howe, Henry A.....	38	100	100 00
Howe, Henry A.....	39	100	100 00
Howe, Henry A.....	413	40	40 00
Howe, Henry A.....	414	135	135 00
Howe, Henry A.....	415	135	135 00
Howe, Henry A.....	416	100	100 00
Hoy, E P.....	437	20	20 00
Hoy, E P.....	438	20	20 00
Hubbard, Geo W.....	178	100	100 00
Isclain & Co.....	unissued	1145	1145 00
Isclain & Co.....	unissued	200	200 00
Joy, Joseph F.....	unissued	135	135 00
Kellogg, Chas.....	unissued	14	14 00
Lackwood, E G.....	unissued	255	255 00
Lentz, Jesse.....	unissued	23	23 00
Litchfield, Edwin C.....	unissued	405	405 00
Lanoran, Chas D.....	unissued	161	161 00
Leo, Arnold.....	200	100	100 00
Loring, James B.....	135	100	100 00
Lewis, D M.....	190	100	100 00
Longmire, Roht L.....	unissued	13	13 00
Miller, Alex.....	unissued	43	43 00
Marshall, Roht.....	402	32	32 00
Monroe & Co, E S.....	unissued	214	214 00
Monroe & Co, E S.....	30	100	100 00
Monroe & Co, E S.....	409	15	15 00
Monroe & Co, E S.....	436	11	11 00
Mayers, Hiram W.....	unissued	107	107 00
Morgan, Geo D.....	unissued	507	507 00
Mackwald, A V.....	94	100	100 00
Oppenheimer, Ed L.....	unissued	70	70 00
Olcott, Horatio L.....	207	100	100 00
Olcott, Horatio L.....	208	100	100 00
Olcott, Horatio L.....	209	100	100 00
Olcott, Horatio L.....	210	100	100 00
Olcott, Horatio L.....	211	100	100 00
Olcott, Horatio L.....	212	100	100 00
Olcott, Horatio L.....	214	100	100 00
Olcott, Horatio L.....	450	63	63 00
Paton, Thomas.....	unissued	232	232 00
Patten, Geo D Jr.....	unissued	20	20 00
Patten, W L.....	unissued	67	67 00
Patten, Leander.....	unissued	100	100 00
Rose, W W.....	41	100	100 00
Rose, W W.....	42	100	100 00
Rose, W W.....	43	100	100 00
Rose, W W.....	44	100	100 00
Rose, W W.....	416	40	40 00
Rentall, James.....	unissued	27	27 00
Rathborne, R W.....	136	100	100 00
Rathborne, R W.....	137	100	100 00
Rathborne, R W.....	138	100	100 00
Rathborne, R W.....	139	100	100 00
Rathborne, R W.....	140	100	100 00
Rathborne, R W.....	141	100	100 00
Rathborne, R W.....	142	100	100 00
Rathborne, R W.....	143	100	100 00
Rathborne, R W.....	144	100	100 00
Rathborne, R W.....	145	100	100 00
Rathborne, R W.....	146	100	100 00
Rathborne, R W.....	147	100	100 00
Rathborne, R W.....	148	100	100 00

Names.	No. Certificate.	No. Shares.	Amount.
Rathborne, R W.....	148	100	100 00
Rathborne, R W.....	149	100	100 00
Rathborne, R W.....	150	100	100 00
Rathborne, R W.....	151	100	100 00
Rathborne, R W.....	152	100	100 00
Rathborne, R W.....	153	100	100 00
Rathborne, R W.....	154	100	100 00
Rathborne, R W.....	155	100	100 00
Rathborne, R W.....	156	100	100 00
Rathborne, R W.....	157	100	100 00
Rathborne, R W.....	158	100	100 00
Rathborne, R W.....	159	100	100 00
Rathborne, R W.....	160	100	100 00
Rathborne, R W.....	161	100	100 00
Rathborne, R W.....	162	100	100 00
Rathborne, R W.....	163	100	100 00
Rathborne, R W.....	164	100	100 00
Rathborne, R W.....	165	100	100 00
Rathborne, R W.....	166	100	100 00
Rathborne, R W.....	167	100	100 00
Rathborne, R W.....	168	100	100 00
Rathborne, R W.....	169	100	100 00
Rathborne, R W.....	170	100	100 00
Rathborne, R W.....	171	100	100 00
Rathborne, R W.....	172	100	100 00
Rathborne, R W.....	173	100	100 00
Rathborne, R W.....	174	100	100 00
Rathborne, R W.....	175	100	100 00
Rathborne, R W.....	176	100	100 00
Rathborne, R W.....	177	100	100 00
Rathborne, R W.....	178	75	75 00
Rathborne, R W.....	179	100	100 00
Rathborne, R W.....	180	100	100 00
Rathborne, R W.....	181	100	100 00
Rathborne, R W.....	182	100	100 00
Rathborne, R W.....	183	100	100 00
Rathborne, R W.....	184	100	100 00
Rathborne, R W.....	185	100	100 00
Rathborne, R W.....	186	100	100 00
Rathborne, R W.....	187	100	100 00
Rathborne, R W.....	188	100	100 00
Rathborne, R W.....	189	100	100 00
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Rathborne, R W.....	192	100	100 00
Rathborne, R W.....	193	100	100 00
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Rathborne, R W.....	195	100	100 00
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Rathborne, R W.....	197	100	100 00
Rathborne, R W.....	198	40	40 00
Rathborne, R W.....	199	100	100 00
Rathborne, R W.....	200	18	18 00
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Rathborne, R W.....	210	100	100 00
Rathborne, R W.....	211	100	100 00
Rathborne, R W.....	212	100	100 00
Rathborne, R W.....	213	100	100 00
Rathborne, R W.....	214	100	100 00
Rathborne, R W.....	215	100	100 00
Rathborne, R W.....	216	100	100 00
Rathborne, R W.....	217	100	100 00
Rathborne, R W.....	218	100	100 00
Rathborne, R W.....	219	100	100 00
Rathborne, R W.....	220	100	100 00
Rathborne, R W.....	221	63	63 00
Rathborne, R W.....	222	400	400 00
Rathborne, R W.....	223	80	80 00
Rathborne, R W.....	224	100	100 00
Rathborne, R W.....	225	14	14 00
Rathborne, R W.....	226	1357	1357 00
Rathborne, R W.....	227	1000	1000 00
Rathborne, R W.....	228	1545	1545 00
Rathborne, R W.....	229	100	100 00
Rathborne, R W.....	230	100	100 00
Rathborne, R W.....	231	5	5 00
Rathborne, R W.....	232	177	177 00
Rathborne, R W.....	233	100	100 00
Rathborne, R W.....	234	100	100 00
Rathborne, R W.....	235	100	100 00
Rathborne, R W.....	236	100	100 00
Rathborne, R W.....	237	100	100 00
Rathborne, R W.....	238	100	100 00
Rathborne, R W.....	239	100	100 00
Rathborne, R W.....	240	100	100 00
Rathborne, R W.....	241	100	100 00
Rathborne, R W.....	242	100	100 00
Rathborne, R W.....	243	100	100 00
Rathborne, R W.....	244	100	100 00
Rathborne, R W.....	245	100	100 00
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Rathborne, R W.....	247	100	100 00
Rathborne, R W.....	248	100	100 00
Rathborne, R W.....	249	100	100 00
Rathborne, R W.....	250	100	100 00
Rathborne, R W.....	251	100	100 00
Rathborne, R W.....	252	100	100 00
Rathborne, R W.....	253	100	100 00
Rathborne, R W.....	254	100	100 00
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Rathborne, R W.....	267	100	100 00
Rathborne, R W.....	268	100	100 00
Rathborne, R W.....	269	100	100 00
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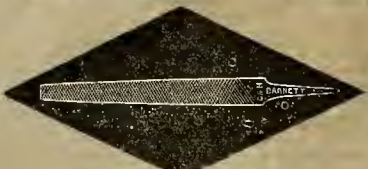
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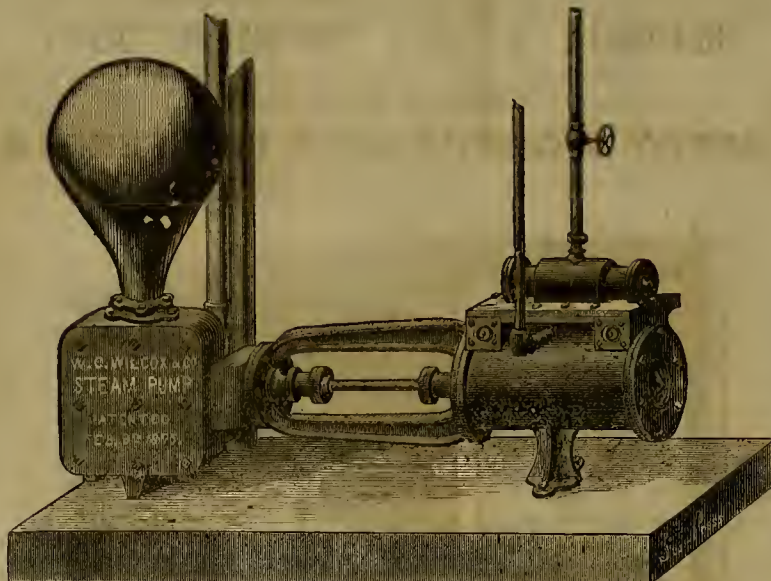
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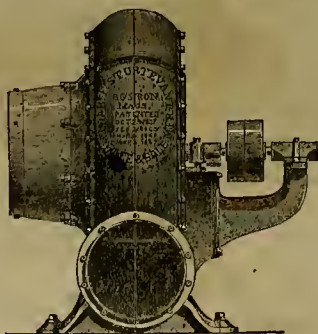
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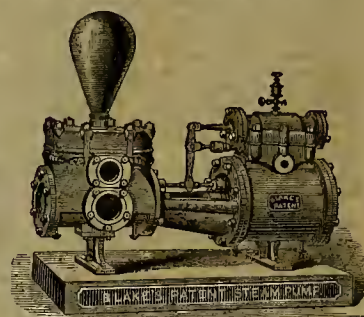
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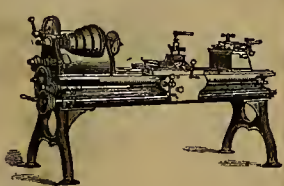
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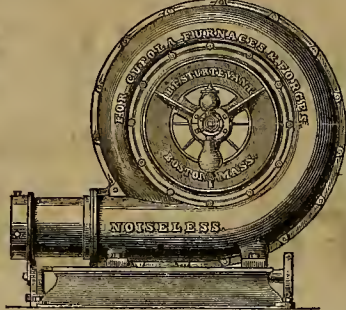
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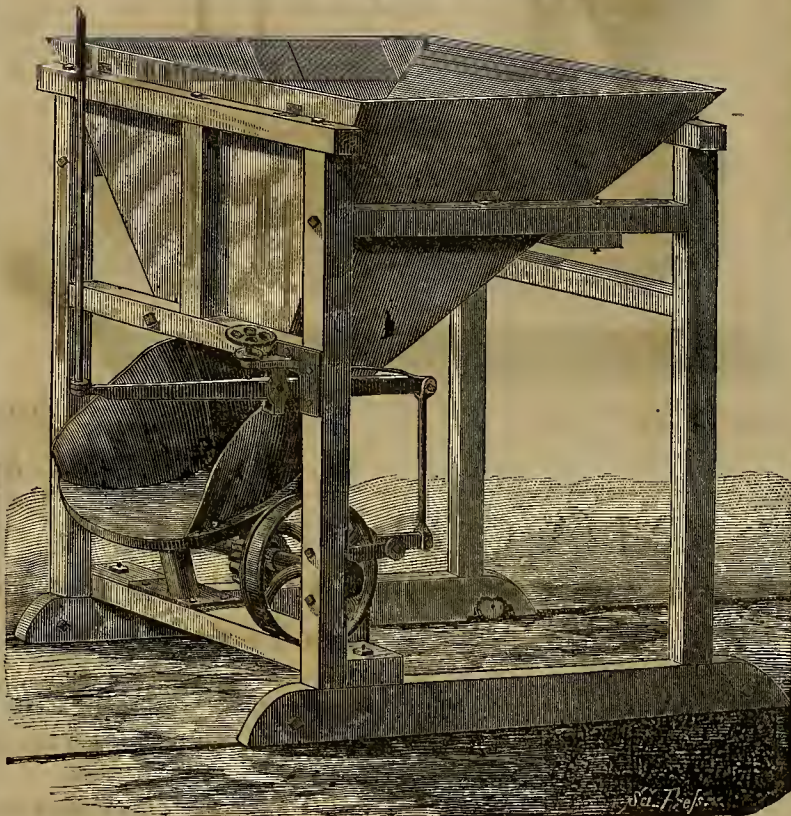
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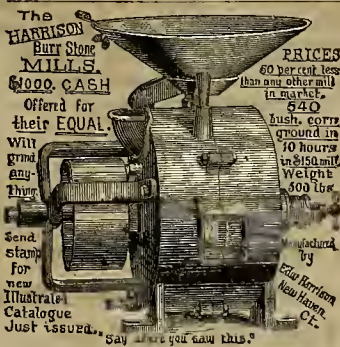
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60 per cent less
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600 lbs.
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Harrison
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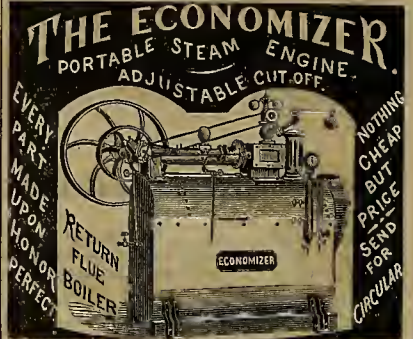
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An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO.,
Patent Solicitors.

SAN FRANCISCO, SATURDAY, JANUARY 22, 1876.

VOLUME XXVII
Number 4.

Notices of Recent Patents.

Among the patents recently obtained through DEWEY & CO.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of mention:

BOILER AND FURNACE.—Joseph Enwright, San Jose. These improvements are especially applicable to portable engines, such as are known as threshing engines, but they can also be applied to stationary engines and boilers, where it is desired to burn straw, grass or other light fuel in the furnace for generating steam in the boiler. When straw or other light, quick-burning fuel is used under a boiler the feeding is continuous; consequently a very high degree of heat is maintained, which ordinary boilers will not stand for any length of time. Other difficulties also present themselves which must be remedied in order to render the utilization of straw as fuel economical. Mr. Enwright's improvements are intended to remedy the difficulties heretofore encountered in this class of engines and provide a superior threshing engine in which either wood, coal or straw can be burned.

BOX TRIMMING MACHINE.—Geo. W. Swan, S. F. This is an improved machine for trimming wooden boxes after they are nailed together, and it consists of a plane mounted between two vertical guides so as to be reciprocated up and down by a crank shaft and pitman in the rear of a table upon which the box is placed. After wooden boxes have been nailed together the sawed ends of the boards which form the sides are rough and generally project somewhat beyond the ends. Heretofore it has been usual to plane these ends off by hand, but by the use of the above described machine the box can be placed upon the table and the rough and projecting ends presented to the reciprocating plane so as to be cleanly and perfectly trimmed. This is another one of the numerous inventions made by Mr. Swan in his special branch of business, the box nailing machine that we have before described being probably the most important.

CONCENTRATOR.—James M. Thompson, San Francisco. This is an improved machine for concentrating and separating the heavy particles of pulverized ore and other finely divided substances from the light portions. The machine can be used for concentrating either wet or dry material. Any intelligible description of the machine is impossible without the aid of an engraving representing it.

MACHINISTS' TOOLS.—We illustrate on this page a twenty-eight inch swing lathe, twelve foot bed, made by the Kidd iron works, Rochester, N. Y. These lathes are all made in a very substantial manner, and are fitted with Gleason's patent tool post. With them is sold center rest, traverse rest, screw gearing, two face plates, counter shaft, cone pulleys, etc. With the Gleason tool post the tool can be elevated or lowered without loosening. It is also perfectly solid, and has the advantage of adjusting the tool without the double saddle, thereby enabling the operator to swing a larger diameter over the carriage than by the old plan.

OVER 10,000 people, coming from almost every State in the Union, have gone to the Black hills during the past three months.

The Fryer Process.

We received this week from Mr. W. A. Skidmore a number of samples of ore from different mines, showing its appearance in the various stages of the Fryer process. There is a quantity of sulphuretted rock from the Omaha mine, after roasting and ready for pulverization. In another package are samples from the same mine, showing the different classes of ore in a raw state, sulphuretted, crystallized and dead white. Samples of the same character of ore after roasting and ready for pulverization are in the same box.

In box No. 4 are samples of gold ore after roasting, from the Gold Run mine, Nevada county, showing the globules of gold. In box No. 3 is the pulp of this class of ore, after the roasting and pulverizing, prepared for amalgamation. It is in an extremely fine powder, and in a dry state. Another box contains tailings (roasted) from the Ophir mine. Samples of silver ore from San Salvador,

closely associated and do more and better work. A mining and engineering section will be immediately formed, some dozen or fifteen new members in that line having been proposed.

A resolution was adopted to the effect that the Academy should formally show its respect to the memory of the late Benjamin Parke Avery, U. S. Minister to China, and a member of the Academy, by attending the funeral in a body.

Charles F. Secor's Return.

His old acquaintances will be glad to notice the return of this gentleman to the Pacific coast. Mr. Secor was here as one of the earliest workers in the silver mines of Nevada, from 1860 to '64, but has been absent for years. We understand he claims the credit of having first applied steam to the reduction of silver ores, in 1863. We believe he is a thoroughly educated metallurgist; he has studied the science of metallurgy not only in this country, but in Swansea and in Freyhurg. He has been

Coral Islands.

On Saturday night last Professor Joseph Le Conte delivered the first of two lectures on the above named subject in Corinthian hall. These lectures are part of a series given by the State University and the Mechanics' Institute. The discourse was illustrated by maps and black-board drawings, and was divided into three parts, viz: First—The anatomy of the polyp, by whose agency reefs and islands are formed. Second—Coral branches, forests, reefs and islands. Third—The different theories regarding their appearance as a whole.

The construction of the polyp was elaborately explained, and also the various species of the same; the food used; how it was digested; its habits, growth, etc.; also the corallum, conditions of its life, etc.

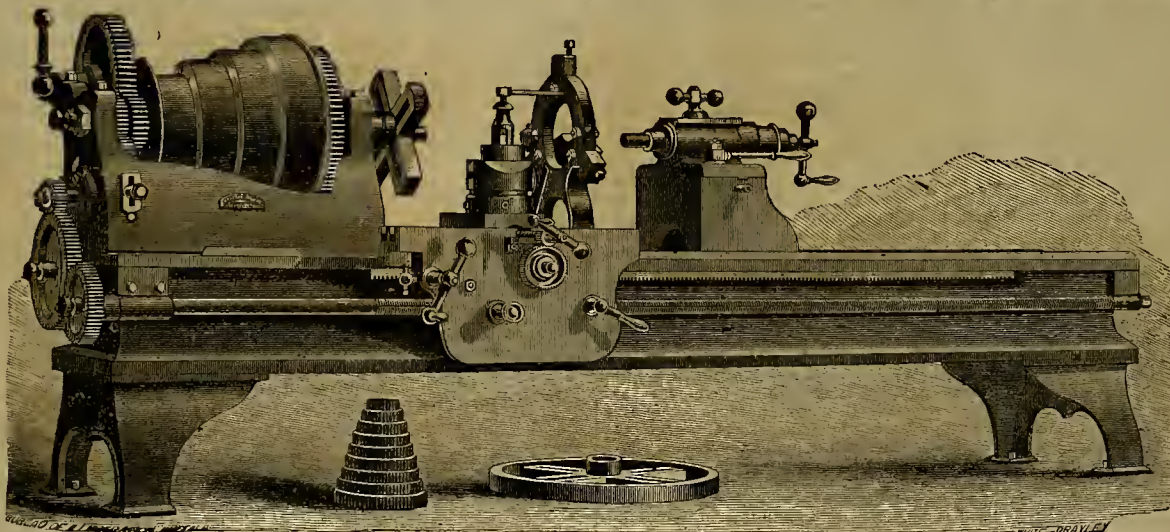
Reefs were described as being divided into three classes, viz: The fringing reef, the barrier and the atoll. The gradual formation of each was illustrated, and their relation to each other described.

The theories respecting their formation was, perhaps, the most interesting portion of the lecture. The Professor gave as the first, the theory that coral islands were formed upon the craters and tops of submerged volcanoes, whose peaks came within the distance from the surface necessary to coral life (from 80 to 100 feet). But this, the lecturer contended, was an exploded theory, as some of the islands, barrier reefs and coral lagoons were as much as fifty miles across, and no volcanic crater could possibly be so large. The second theory was that of Darwin, and was undoubtedly correct, and had been received as such by the scientific world. It is this: Darwin con-

tends that the floor or bottom of the ocean has subsided, and is subsiding gradually. Suppose every reef to have commenced as a fringing reef. If the floor had remained stationary, the reef would always have remained a fringing reef; but the floor has gradually and slowly sunk downward. If it had sunk rapidly, the consequence would have been to have carried the corals down below their depth; but it went down so gradually that the corals were able to keep in breathing space of the surface—within the conditions necessary to their life. The theory is confirmed by investigation, for the space in which these reefs and islands are not found in the Pacific is first surrounded by small islands; second, the atoll; third, the barrier, and finally by a ring of fringing reefs. This completely explains the Darwin theory; the fringing reef marks the margin of the depression.

In concluding his remarks, Professor Le Conte said: Every atoll reef marks the spot of a drowned volcanic island, and is literally a monument erected by these mound builders, surmounted by a snowy chaplet of coral and a wreath of green trees.

THERE was a heavy snow-slide at Silver Mountain last week, at the Exchequer mine, burying three workmen, one of whom, William Bartle, was fatally injured by crushing in the hoisting works. Fortunately the engineers were at dinner, or they would have surely been killed, for all the machinery was completely covered. Nothing can be done to restore the works at present, as there has for some time been no possible communication with the mine, except by snow shoes.



TWENTY-EIGHT INCH SWING LATHE, TWELVE FOOT BED.

Central America, before treatment, were received, and also samples of the same class of ore after the preliminary roasting, showing globules of native silver. We shall be happy to show these various samples to those who are interested in this subject, a number of persons having already examined them.

We desire to inform our readers, moreover, that we will in our next issue give a detailed description, with illustration, of the furnace used in the Fryer process. The engravers were unable to complete the cut in time for this number, but public curiosity on the subject of the furnace may be gratified next week. As soon after as convenient we will illustrate and describe the other apparatus used in the process, Mr. Fryer having given us permission to do so.

California Academy of Sciences.

The regular semi-monthly meeting of the California Academy of Sciences was held on Monday evening last. Little of general interest transpired. Vice President Edwards read a paper on Pacific Coast Lepidoptera, (No. 16,) being one of a series on this subject. Dr. Gibbons presented a memorandum of the dates, number and locality of earthquakes occurring in December, stating that they had been very frequent in various parts of the globe.

The committee appointed to consider the matter of sectionizing the Academy presented their report, giving their plan in detail, which was adopted. The idea is to form sections in the various branches of science, by which the workers in any special department will be more

practicing and testing the reduction of metals for twenty years, as we have been informed, and he now comes to this coast for the purpose of introducing an amalgamator for the reduction of gold and silver ores, which is the result of this experience. He claims that he can reduce the most of gold and silver ores by the application of steam, at an expense not to exceed three dollars per ton. The economy of the process is the most important part of it. We have not seen Mr. Secor's amalgamator and cannot therefore speak of it from our personal knowledge. He enters the field of discovery simply as a competitor for public favor and public patronage. If his discovery has not the merit which he claims for it, of course it will not receive encouragement. In the reduction of metals success is the only test of merit with any machine or with any process.

We understand that Mr. Secor will soon be ready to give a practical test of his machine, and we therefore welcome him to the field of competing inventors and discoverers, and we commend his amalgamator to the most careful examination of our mining experts and our most skillful metallurgists. We expect to notice the machine in detail as soon as an opportunity is afforded us.

THE work of extending the Utah Northern railroad is steadily progressing and the grade is nearly completed, ready for the ties, ten miles beyond Franklin, while considerable work is being done on the next five miles to the mouth of Bear River canon, and the tunnel and approaches will probably be completed by spring.

CORRESPONDENCE.

Hydraulic Gold Mining in California.

[No. 6.—Written for the Press by C. J. Brown.]

MESSRS. EDITORS:—Again, after a silence of many weeks, caused by circumstances and conditions beyond my immediate control, I take up the subject of my letters where I left off with a promise to pay my respects to other mining companies operating in this vicinity. The first that claims my attention is the

Polar Star

Hydraulic mining company, a California corporation, with its principal place of business at San Francisco; all the stock is owned by substantial business men of financial means. It is the owner of the claims once known as the American, the Buckeye, the Phoenix and some smaller tracts, embracing sixty-five acres, and covering the Dutch Flat channel from rim to rim at its inlet, or, in other words, at the upper or northeastern end of the deep gravel deposit on this channel. The surface bench of gravel was washed off many years ago, and the claims have lain idle ever since. Except the Buckeye, none of the ground on this end of the channel has ever been drifted. It was all worked as early as 1857-8, which continued actively for eight or ten years. The Buckeye has been quite extensively drifted, and formerly paid its owners large dividends. It was owned by a company of Welsh miners, who were ever clamorous enough to work, drink, and fight among themselves, and buy from and sell to each other until, through mismanagement growing out of their almost constant contentions, the claim failed to be remunerative and they ceased work. The present owners came into possession of the ground called now the Polar Star claim, about eight months ago.

Mr. John S. Colgrove, a member of the company, is the superintendent. Mr. Colgrove has been a resident of this town for the last seventeen years, engaged in hydraulic mining, and is, truly, not only a representative miner with large experience, but a man of extensive and varied general information; he is a careful business man, with more than an average business capacity; he is, above all, a good thinker, with sound judgment. He thinks slowly, but always to a purpose; intensely sanguine, he never admits a possibility of failure; lacking idealism, he is wholly, I may say severely, practical and realistic; he is sufficiently methodical for all business purposes, and lastly, and chief of all his attributes, a thoroughly honest man, "The noblest work of God." I cannot say less of the superintendent of the Polar Star, notwithstanding I have been, by many of my acquaintances, accused of sycophancy because of my published estimate of the ability and character of the superintendent of the Cedar Creek company. I never bow the knee to Mammon, place or pelf, nor indulge in obsequious flattery. I give my estimate of these men for the very reason that the success or failure of any mining enterprise in our deep gravel beds depends largely upon the pilot at the helm, and I confidently advance the opinion that not one out of every hundred of even our old hydraulic miners can successfully conduct one of our mining enterprises of to-day, nor is one in twenty fit for, simply, a foreman; consequently a good superintendent must be a good judge of men as well as measures. We have had enough of dorseyism, dishonesty and defeat, and I am proud to chronicle what I conscientiously believe to be the dawn of successful deep hydraulic mining in this section.

In connection with the Polar Star I will also treat of the

Southern Cross

Hydraulic mining company. Mr. Colgrove is superintendent of both, and the development of each is carried on in a measure jointly. This company owns what was formerly known as the Dutch Flat mining claim, embracing forty and one-fifth acres, adjoining the Polar Star on the west or lower down the channel; it reaches from rim to rim, lies in a compact body and is a valuable piece of property. Mr. Colgrove has been one of the principal owners and workers of this claim for many years while the top bench was being worked off. It is impossible to tell what the Polar Star ground has paid, but we have the account of the Southern Cross, from which has been taken \$155,000, more than one-quarter of which was paid for water alone. This claim has put more clear money into the pockets of its owners in the shape of dividends than any other hydraulic claim in the district. The gravel over the center of the channel is 220 feet deep, while on the Polar Star it will not average along the deep channel portion more than 175 feet.

The Southern Cross is a California incorporation, the members thereof also being stockholders in the Polar Star. Both claims were purchased and incorporated upon at about the same time, and Mr. C. J. I understand, is largely interested in both. Previous to the purchase a contract was entered into between these companies and the South Yuba canal company, by which the latter bound itself to furnish to the former, as long as desired, 3,000 inches of water. They then purchased and contracted with the Gold Run ditch and mining company to run two tunnels—one for each claim—600 feet for the Polar Star and 1,050 feet for the Southern Cross. The latter company, being the owner of a Burleigh drilling machine, which they

work by air compressed by steam power, commenced work on the

Polar Star Tunnel

On the 20th day of last August. This tunnel is already completed, and over four hundred feet of the Southern Cross has already been run; it, too, will be completed, probably as early as the first of next June, possibly before. These tunnels are 9x9 feet on a ten inch grade to every twelve feet, run in the inevitable hard trap stratum of rock which underlies this gravel deposit, as before explained. The months of these tunnels are about 1,200 feet apart, and both debouche into the canon of Bear river, 500 feet above the bed of the stream. The head of the Polar Star tunnel is thirty-four feet below the surface of the rock under the center of the channel, and 209 feet below the surface of the gravel. An incline, now nearly completed, is being raised from the head of the tunnel, at an angle of about fifty degrees, 8x8 feet in dimensions and 150 feet long.

The head of the Southern Cross tunnel, under the center of the channel, will be forty feet below the surface of the rock, and 260 feet below the surface of the gravel. Tail-flumes will be laid, in fact, are now being constructed along down on the side of the canon to the river, provided with a suitable number of under-currents, which are indispensable as gold-savers. These flumes will be five feet wide and paved with blocks. Mr. C. is, as yet, undecided as to fluming the tunnels for a year or two after washing commences. Should he conclude not to, he designs to try the somewhat novel experiment of laying cross ties therein, six or eight feet apart, paving between them with rock, and lay the whole with the heaviest railroad rails, placed about eight inches apart. Should he conclude to lay a flume in the first instance, it will be paved with blocks, and then laid with rails.

Of course, he would not expect to clean up the tunnels until the rails had fulfilled the purpose in view, which may be stated thus: I know of other hydraulic mines in California bearing great masses of large boulders—tough, dense trap boulders, which predominate in the lowest or blue stratum of dirt—as the mines of the Dutch Flat district; in this respect our mines excel. The giant powder consumed at the Yankee claim in the blasting these boulders has cost, on an average, \$50 every twenty-four hours, aggregating \$1,500 every month for powder alone, and this, when we consider the men employed and time expended in blasting and clogging the boulders, the waste on eddies, gads and picks, regardless of the loss arising from the non-use of water while thus engaged, cannot be less than half the actual expense of reducing the rocks. Mr. Colgrove purposes to avoid this expense by the adoption of the above mentioned device until such time as he shall have opened his claim to the bed-rock, and cleared a space for a derrick, and the boulders to be swung back by it, which will, I predict, be at least two years from the time he commences washing. It will require a large amount of water to move the boulders whole than in fragments, but he will have a much better bank of dirt and fine gravel to aid him than he to be had in the Yankee, for in neither the Polar Star nor Southern Cross is any of the barren trap-slide found except upon the eastern side of the channel. The chief difficulty which he will experience in carrying out this plan, will be in forcing his large boulders into the sluice. When once started with the current of water and earth fairly behind them, they are likely to rest in Bear river, but it is my opinion that this cannot be done, except near to the opening of the incline, unless he washes above the bed-rock on a steep up grade as he recedes from the opening; this plan may be followed, for I am convinced that twenty feet of the bottom will pay much better to mill than to hydraulic.

In my next I will give an account of the preparations for hydraulic on these claims. Dutch Flat, Jan. 11th, 1876.

Manufactories of San Francisco.

We take from the *Bulletin* the accompanying interesting tabulated statement concerning the manufactures of San Francisco, giving the details of cost, value of products, capital, wages, men employed, etc.: "A little over three years ago the *Bulletin* published an industrial exhibit, which showed that the manufactures of the city for the previous year equalled \$52,603,475 in value, without taking into account the value of gold and silver refined. The exhibit now published shows the value for 1874 to have been \$67,333,930—a little over twenty-five per cent in excess of that of 1871. The vantage ground gained is satisfactory, as at the rate of twenty-five per cent. every three years the quantity of manufactured goods turned out of our industrial establishments would be doubled every ten years. Indeed, there is no limit to the industrial development of San Francisco. Favorably located and adjacent to countries with teeming populations, with no competitor for their trade nearer than England, Germany or France, its situation and advantages would seem to justify very extravagant dreams of future industrial and commercial empire. Even as it is, and with a trade only in embryo, our far off competitors manage to sell on the coasts of the Pacific manufactured goods annually worth \$150,000,000. So that irrespective of all future developments in Pacific commerce, we have even now a mighty trade to conquer, as our exports of local manufactured goods to all countries last year did not exceed in value \$4,369,250.

"The labor employed in the manufactures of this city represents, with those dependent on

it for support and the trades people patronized, at least one-third of the whole population. The total number of hands employed last year was 24,490, of whom 10,813 were Chinese. Of the rest 9,713 were white men, 2,697 white women and girls, and 1,485 white boys. The wages paid amounted to \$11,251,943, or under \$500 per annum. But it must be remembered that the Chinese, women and boys, aggregating 14,995, or about three-fifths of the whole number employed, hardly average a dollar a day.

The average of the white men employed would be about \$700 per annum, but most of the white labor is unskilled. Skilled artisans earn from \$3 to \$5 per day, and average, taking into account slack periods, \$850 to \$1,000 a year. Some Chinese cigar makers earn \$15 a week, and a few still higher wages, and many white women do quite as well. The number of new industries springing up is rather limited, or rather a great number after being tried for a while are again abandoned."

MANUFACTURES OF SAN FRANCISCO FOR THE YEAR 1875.

Manufactories.	No. Est.	Value of Material Used.	Capital Invested.	White Lab.			China Labor.	Total Labor.	Wages.	Value of Products.	Value of Exports.
Iron and Steel				W'n	W'n	W'n					
Foundries, etc.	47	\$344,400	\$2,869,000	1440	224	1664		1684	\$988,000	\$4,010,000	\$190,000
Rolling Mills.	1	404,230	1,000,000	301	18	385		385	199,977	730,780	
Wire Works.	1	38,000	100,000	11		15	15	18	5,000	95,000	600
Wire Rope.	1	80,000	60,000	11				11	9,000	184,000	5,000
Saw.	1	32,000	80,000	26	4			30	30,000	90,000	5,000
Cutlery.	2	5,000	30,000	30	4			34	25,000	40,000	1,500
Screw and Bolt.	2	37,500	30,000	15	4			19	14,700	60,000	
Electrical Inst.	1	10,000	60,000	34	3			37	35,000	20,000	2,000
Springs.	1	30,000	50,000	24	6			30	14,000	60,000	
Miscellaneous.	17	95,000	103,600	80	20			100	67,000	217,400	
Total.	77.	\$1,676,180	\$4,332,600	1964	283		31	2278	\$1,388,677	\$5,606,780	\$204,100
Lead.											
Smelting.	1	\$1,200,000	\$800,000	10			60	70	\$25,000	\$3,000,000	\$800,000
Shot.	1	130,000	200,000	8			12	20	10,000	200,000	
Type.	2	20,000	50,000	15	15	8		38	19,000	45,000	
Total.	4	\$1,350,000	\$1,050,000	33	15	8	72	128	\$54,000	\$3,245,000	\$800,000
Gold and Silver.											
Jewelry.	20	\$450,000	\$356,000	170	30		200	200	\$152,000	\$600,000	
Silverware.	3	80,000	100,000	60	10		70	70	60,500	300,000	
Silver-plating.	6	13,000	15,000	20			20	20	18,000	48,500	
Miscellaneous.	4	7,000	6,000	7			7	7	5,000	20,000	
Total.	33	\$550,000	\$487,000	267	40		297	297	\$235,500	\$968,500	
Brass and Bell.											
Brass and Bell.	7	\$156,000	\$260,000	130	30		160	160	\$117,000	\$320,000	\$15,000
Timware.	60	\$250,000	\$145,000	112	34		146	146	\$79,500	\$503,000	\$70,000
Lumber.											
Furniture.	21	\$543,000	\$1,200,000	334	40	63	437	437	\$200,000	\$1,930,000	\$100,000
Carriage, etc.	24	590,000	750,000	360	8		368	368	300,000	1,850,000	10,000
Box.	10	500,000	200,000	256	20	15	291	291	155,000	1,000,000	1,000
Doors, etc.	10	671,181	671,181	523	50		603	603	510,400	1,630,000	12,000
Cooperage.	31	200,000	175,000	180	35		215	215	110,000	380,000	
Billiards.	4	30,000	150,000	80			88	88	70,000	135,000	
Match.	6	50,000	125,000	6	2	80	88	88	30,000	225,000	10,000
Trunk.	6	150,000	225,000	50	3	31	90	90	55,400	120,000	10,000
Picture Frames.	12	240,000	197,000	118	15		133	133	88,000	491,000	
Woodenware.	2	20,000	150,000	25		60	85	85	42,500	200,000	6,500
Brush.	4	35,000	35,000	16	8		24	24	17,150	60,000	9,500
Stair.	3	124,000	45,000	80	4		84	84	80,000	125,000	
Lock.	2	20,000	15,000	21	2		23	23	14,000	30,000	
Turning, etc.	5	60,000	20,000	26			26	26	27,800	100,000	
Paper Box.	3	24,000	30,000	7	26	6	41	41	15,600	50,000	600
Ship Blocks.	5	13,000	25,000	25			26	26	16,000	40,000	
Windmill.	4	30,000	30,000	15			15	15	12,000	50,000	
Boat.	9	12,500	5,000	21	3		24	24	11,500	20,000	
Bellows.	2	9,500	10,000	6			6	6	4,800	18,000	1,000
Total.	164	\$3,317,181	\$4,079,181	2162	31	189	283	2665	\$1,755,650	\$7,958,000	\$170,000
Leather.											
Boots and Shoes.	40	\$1,654,440	\$1,500,000	1288	326	185	1283	3083	\$1,400,000	\$3,949,000	50,000
Saddles and Har.	17	200,000	650,000	269	14	27	50	360	233,000	525,000	90,000
Hose and Belting.	2	50,000	82,000	15	1		16	16	13,400	100,000	
Leather.	38	620,000	850,000	350	10	30	350	350	250,000	1,550,000	200,000
Total.	97	\$2,524,440	\$3,082,000	1882	340	224	1363	3800	\$1,896,040	\$6,115,000	\$340,000
Fabrics.											
Woolen.	2	\$550,000	\$1,200,000	153	92	91	534	870	\$376,000	\$2,000,000	
Silk.	1	39,000	100,000	4	50	6		60	25,000	60,000	
Frings.	3	14,000	12,000	16	13	5		34	21,500	35,000	
Carpet.	1	2,800	1,500	6				6	3,200	7,000	
Total.	7	\$605,800	\$1,313,500	179	155	102	534	970	\$425,700	\$2,102,000	
Dry Goods.											
Clothing (Men's).	60	\$400,000	\$690,000	324	232		590	1146	\$553,000	\$1,470,000	
do (Women's).	60	750,000	380,000	729			720	720	296,000	1,500,000	
Hats and Caps.	15	120,000	90,000	40	22	1		63	60,000	250,000	\$1,500
Furs.	5	40,000	50,000	60	60		120	120	60,000	125,000	30,000
Shirt.	18	164,000	160,000	30	330		200	560	184,000	610,000	
Umbrella.	3	40,000	30,000	3	44	3		50	27,000	85,000	
Glove.	3	54,000	60,000	10	3	63		81	42,400	200,000	
Oil Clothing.	1	10,000	20,000	7	4		20	31	15,000	30,000	
Neck Tie.	2	10,000	6,000	8	10		16	16	9,000	20,000	
Miscellaneous.	4		25,000	18	51	10		79	38,000	110,000	
Total.	171	\$1,088,000	\$1,511,000	497	1476	82	310	2865	\$1,285,900	\$4,300,000	\$31,500
Malt and Spirituous Liq's.											
Breweries.	43	\$837,000	\$720,000	310			310	310	\$205,000	\$2,400,000	\$2,000
Liquors.	4	100,000	150,000	10		9	24	43	16,200	471,000	20,000
Malt.	9	200,000	150,000	40			40	40	30,000	340,000	
Distilleries.	6	538,180	150,000	100			100	100	60,000	1,600,000	
Champagne.	1	21,600	140,000	14			26	40	19,000	120,000	
Soda Water.	5	64,000	130,000	48			48	48	35,000	200,000	
Total.	68	\$1,730,780	\$1,440,000	522	9	50	581	581	\$365,200	\$5,131,000	\$22,000
Groceries and Provisions.											
Sugar Refineries.	4	\$4,024,000	\$3,000,000	360			360	360	\$205,000	\$5,200,000	\$381,650
Flouring Mills.	4	2,500,000	400,000	140		6	140	140	120,000	3,000,000	1,850,000
Canning.	5	1,400,000	300,000	225	200	1000	1500	1500	150,000	1,200,000	160,000
Pork Packing.	8	312,000	350,000	150			153	153	90,000	90,000	100,000
Coffee and Spice.	10		800,000	69			20	20	100	46,400	1,380,000
Bread.	3	300,000	120,000	73			73	73	60,000	750,000	30,000
Candy.	30	200,000	170,000	60		10	70	70	60,000	670,000	10,000
Salt.	2	100,000	190,000	5		17	24	24	10,740	230,000	
Yeast Powders.	4	40,000	150,000	6		6	17	23		52,500	2,500
Macaroni.	3	30,000	100,000	3			36	36	20,000	120,000	16,000
Mustard.	1	19,500	50,000	6			6	6	5,000	170,000	
Vinegar.	8	41,650	58,000	6			45	52	18,800	125,500	
Miscellaneous.	1	15,000	10,000	11			11	11	13,800	30,000	
Total.	75	\$9,002,150	\$6,233,000	993	225	242	1100	2552	\$812,240	\$13,978,000	\$2,342,150
Animal Products.											
Soap.	23	\$800,000	\$300,000	60			80	140	\$72,000	\$950,000	\$50,000
Candles.	2	320,000	100,000	7			98	103	36,400	420,000	
Glue.	1	50,000	60,000	27			10	37	18,900	90,800	25,000
Miscellaneous.	4	48,000	50,000	10			12	22	10,600	120,000	2,500
Total.	30	\$1,018,000	\$510,000	104			200	304	\$137,900	\$1,680,800	\$77,500
Miscellaneous.											
Cigars.	120	\$1,400,000	\$2,000,000	50			6000	6050	\$1,815,000	\$5,026,400	\$100,000
Mead Mills.	5	1,400,000	275,000	70			5	75	46,500	800,000	30,000
Oil and Lead.	1	200,000	500,000	15				15	9,500	300,000	60,000
Chemicals.	5	200,000	300,000	30				37	19,000	400,000	1,000
Cordage.	3	250,000	500,000	30				75	80,000	350,000	
Bag.	3	342,000	24,800,000	130	358	118	50	104	51,116	450,000	
Marble.	18	80,000	300,000	130	20		150	150	110,000	320,000	25,000
Blank Books.	10	92,000	79,000	47	32		169	169	110,000	311,000	
Glass.	2	95,000	145,000	75	40	32	147	147	100,000	228,000	5,000
Artificial stone.	2	85,000	60,000	10		50	60	60	20,500	130,000	
Brooms.	6	54,000	120,000	6		96	102	102	33,000	215,000	50,000
Sail.	19	138,000	30,000	50			8	63	39,750	200,000	
Belting.	2	100,000	70,000	14			3	30	40,000	170,000	
Photography.	50	75,000	160,000	120	22	12	6	160	126,650	301,550	
Pipe.	2	45,000	20,000	6			7	13	6,380	105,000	
Smoking Tobacco	2	20,500	15,000	7	11	7	10	35	12,850	50,000	
Wood Preserving.	1	85,000	65,000	20			4	24	15,000	180,000	
Plaster Ornament's	2	13,000	22,000	10		4	14	14	10,000	30,000	400
Borax Refining.	3	140,000	150,000	9		18	27	27	10,800	210,000	
Fire works.	2	7,500	15,000	8				8	5,000	20,000	
Mirror Working.	1	25,000	60,000	14				10	5,000	35,000	
Glass Staining.	2	10,000	5,500	12		1	13	13	11,400	40,000	
Paint.	3	70,000	2,000,000	11		7	18	18	12,000	105,000	
Oil Refining.	1	30,000									

SCIENTIFIC PROGRESS.

Cause of the Distance between Flame and Burner.

The fact that a gas flame does not touch the burner, nor the candle flame the wick, was examined by B. Blockman. In a bright luminous flame the contrast of the luminous part is so great as to admit of close observation; but, if the cock is gradually closed, a small space will be seen between flame and burner, which becomes more and more distinct as the flame decreases. This intervening space is considerably increased when the gas is mixed with an indiffereat gas—as nitrogen, carbonic acid, etc. It is thereby possible to increase this intervening space, with a quick gas current issuing from the burner up to two inches and more. Blockman found by experiments that the cause of this rising above the burner was not the result of increased pressure, and inferred that it was a consequence of dilution with indiffereat gas. He explained this phenomena as follows:

After asserting that not only in sounding flames, but in other flames as well, an instantaneous combustion always takes place in the lower part of the flame, which can only be the case when the escaping gas has mixed with exactly the right proportion of air, he finds the increasing distance between the flame and burner, resulting with dilution with indiffereat gases, based on the following:

"The diluted gas on leaving the burner mixes instantly with air. The constancy of the flame requires with this mixture a certain amount of combustible gas. In order not to produce in this case a combustible mixture which contains as much gas as the one which would be produced if undiluted gas escaped from the burner, a much larger volume of gas must leave the burner—i. e., the distance between the burner and flame must be increased."

To this somewhat forced explanation objection is made on account of the following facts: If carbonic acid is somewhat in excess, the flame may be extinguished by the smallest current of air. The more carbonic acid the gas contains the more space will be found between the flame and any cold body introduced therein—for instance the hole made in the flame by the introduction of a cold thick wire. If the amount of carbonic acid is increased to such an extent that the flames will be one inch or more away from a burner tube, say of rolled sheet platinum, placed horizontally, and the tube is then heated near the open end by a Bunsen burner, the flame will approach the burner, and as soon as the platinum tube becomes red hot, the flame will commence at the outer rim of the tube without intervening space, while a non-luminous flame which contains large quantities of indiffereat gas becomes extinct for quite a large space upon the introduction of a cold, thick wire; the opening made in the flame closes gradually as the wire becomes heated. In case the wire is heated previously, there will be no space produced, and the flame will touch the wire all around. In a much diluted flame these phenomena are much more apparent, but even in the common gas flame they are quite distinct.

All these facts force upon us the conclusion that these spaces are produced by heating influences; that the spaces are increased in flames much diluted by indiffereat gases is only a consequence of the already low temperature—which in turn is a consequence of the large volume of gas which takes up the heat of the quantity of gas burned in the unit of time. The flame will join itself to the red hot burner tube even when produced by diluted gases.

It seems, therefore, to be proved beyond doubt, that in all these experiments the intervening space is produced solely by the cooling action of the burner, or by the same action of the cold object introduced into the flame.

The Frog in Science.

St. George Mivart, of London, has recently published an interesting volume on "The Common Frog." The opening of the work is devoted to the consideration of

What is a Frog?

To the casual observer the question may appear susceptible of a ready answer, but a perusal of this work will show that to define a frog accurately many facts have to be taken into consideration, for while the great majority of persons—even with some scientific knowledge—would class it with reptiles, it in reality differs as much from that genus as it does from fishes, mammals, and birds. Very few creatures present so many phenomena as the frog, and it is therefore surprising zoologists have, as a rule, paid so little attention to it; but as Mr. Mivart observes, "The frog is the never-failing resource for the physiological experimenter."

It would take long indeed to tell the sufferings of the much-enduring frog in the cause of science! What frogs can do without their heads; what their legs can do without their bodies; what their arms can do without either head or trunk; what is the effect of the removal of their brains; how they manage without their eyes and without their ears; what effects result from all kinds of local irritation from chokings, from poisonings, from mutilations the most varied? These are the questions again and again addressed to the little animal which,

perhaps more than any other, deserves the title of "the martyr of science." In the course of his investigation into the structure and nature of the frog, the author dissects each portion and contrasts it with other vertebrate animals, and this examination makes known to us an animal of peculiarly specialized and perfect organization. The definition attained is that the frog is a "Tailless, lung-breathing, branchiate vertebrate, with four limbs typically differentiated, undergoing a complete metamorphosis, and provided with teeth along the margins of the upper jaw"—a definition which we venture to say very few persons could have given. A tabular statement is given showing the differences which exist between the frog and the entire class of fishes, reptiles, birds and mammals.

New Alloy for Iron—Soft Steel.

Experiments prove that by using chromic iron instead of spiegel-iron, extremely soft steel is obtained; rods made for experiments were very easily bent, even by hand. It is seen, from these attempts to replace spiegel-iron by chromic iron, that the use of the chrome iron alloys is limited, and the steel obtained is for most purposes too soft for the manufacture of such materials as rails, axles, tires, etc.

During some experiments with the chrome iron alloys, a strange phenomenon was observed. It is well known that chromium is extremely hard, and scratches even hardened steel; meanwhile an alloy was obtained which was malleable, and in a fresh state could be easily bent. It was also remarked that sometimes in opening the crucibles nothing but slag was found; but in breaking the crucibles, the alloy was found to be in the bottom of them. That may be attributed to the corrosive properties of the liquid alloy, which often penetrated even through the bottoms of plumbago crucibles.

The above mentioned alloy was analyzed, and the following average composition was found: Metallic iron, 96.40 per cent.; metallic chromium, 2.30 per cent.; carbon, traces; lime, silica, 1.30; total, 100.00. By melting a mixture of cast iron, tin, and lead in the following proportions, a very liquid alloy is obtained: Cast iron, 79.00 per cent.; tin, 19.50 per cent.; lead, 1.50; total, 100.00.

The alloy has a very handsome appearance, and fills perfectly well the casting molds; thus it could be used for casting small articles. The alloy is to some degree malleable.—*Chemical News.*

THE NEW METAL, GALLIUM, ISOLATED.—Gallium has at last been obtained in a metallic form. On December 6th, M. Wurtz submitted a specimen of it to the Academy of Sciences. It is a beautiful metal, taking rank for luster between platinum and silver. It was obtained by electrolysis of the aqueous solution of its ammoniacal sulphate, the precipitate being submitted to the furnace. M. Lecoq, the discoverer of the new element, has been pursuing his investigations, and finds that it dissolves in hydrochloric acid with disengagement of hydrogen, feebly in the cold and more easily when aided by heat. Gallium having strong affinities with zinc the separation of the two metals is not at all easy. To effect it, M. Lecoq treats the solution of the two metals with carbonate of soda, which precipitates all the gallium and only a little zinc. The precipitate is redissolved in sulphuric acid, and neutralized by an excess of ammonia. Acetic acid being added the whole is boiled. The oxide of gallium is precipitated, behaving in this like the oxide of aluminium. As another analogy with aluminium may be noted the combination of the sulphate of gallium with alkaline sulphates, giving origin to an alum, which crystallizes in cubes.

THE SUN.—At a lecture recently delivered in Glasgow, Scotland, by J. Norman Lockyer, on "Recent Researches into the Chemical Constitution of the Sun," Sir Wm. Thomson, who presided, remarked at the outset, that much of what we knew as to the chemical constitution of the sun was due to Mr. Lockyer's own researches. In the course of his address Mr. Lockyer referred to the metals that were known to have existed in the sun previous to the discovery of the new methods of analysis more recently employed, and the additional metals the presence of which has since been revealed. He pointed out that by means of photography the solar spectra could now be much more easily and accurately compared with the spectra of individual metals, and he also described methods by which not only qualitative but a quantitative analysis of the sun's spectrum could be made. The introduction of photography alone had resulted in eleven new metals being added to the list of solar metals within the last few months.

MAGNET OF IRON FILLINGS.—Jamieson has read before the Academy of Sciences a paper on the production of magnets from fillings of soft iron. These are collected in copper tubes, subjected to pressure, and magnetized in the usual way, a magnetic force being induced which is equal to that of a steel rod of similar dimensions. The case is thus presented that a metal possessing in its whole state no magnetic power, may by division and the compression of its particles into a new body take on as great an inclination for magnetism as steel. The polarity is supposed to depend upon the separation of the particles, and the magnetic property of steel is supposed to be referable to the same principle.

THE NEW TELEGRAPH KEY.—A new key is being put into the telegraph offices of the Pennsylvania railroad. Under the existing system a key and sounder are required for every wire with which an office has connection. The new key can be connected with a dozen or more wires in turn, and requires no separate sounder. The key revolves upon a disc of hard rubber, attached to which, and projecting from its under surface, are a number of platinum points, representing as many connecting wires, to any one of which the key can be turned, and it can be disengaged by a touch. This mode of connection, apart from its convenience, is said by the operators to obviate a difficulty familiar to those using the old key, whose point of contact is in the armature upon which it works, in which the current is frequently weakened or interrupted by the clogging of the points resulting from the constant friction.

A MAGNETIC ISLAND.—The volcanic rocks composing the foundation of the Isle St. Paul are ferruginous. Those on the north side of the crater, which result from the slips whereby all the east side of the mountain is laid bare, attract the two poles of a magnet, and contain 6 per cent. of iron. Those met with around the cones of scoria, situated at the foot of the exterior slopes of the crater, on the sea shore, are true magnets with two poles, containing 14 per cent. of iron. The observations made for declination and inclination indicate the local action of a south pole toward the center of the crater, a fact which should warn navigators to guard against the magnetic influence of this isle.—*Comptes Rendus.*

MECHANICAL PROGRESS.

The Brayton Aero-Gas Engine.

One of the notable features of the last meeting of the Wagner Institute, at Philadelphia, was the exhibition of the so-called Brayton motor and aero-gas engine of quite original construction, which has attracted considerable attention from our engineers. The chief points of novelty of this device will appear from the following description: In construction this engine closely resembles the steam engine; its cylinder and piston, its valve gear and its connections being essentially the same. The principal difference consists in the addition of a compressing pump and a reservoir, for the purpose of compressing and of retaining a quantity of combustible gases, mixed with a proper proportion of air for its complete combustion, and at a pressure exceeding that which is proposed to have exerted in the working cylinder. This reservoir, therefore, stands in the same relation to the engine as does the boiler to the steam engine. A jacket surrounds the cylinder, through which water is kept constantly circulating. The comparatively low temperature thus secured in the walls of the cylinder permits of the adoption of the same construction of piston, with its metallic packing rings, which has become standard in the steam engine. It also permits of the same method of lubrication. A diaphragm, composed of several layers of wire gauze, is placed at the opening, through which the gaseous mixture enters the cylinder. This is of more closely woven material than that used in the safety lamp, as well as of several thicknesses instead of but one, and is an effectual preventive of the ignition of the mass of gas enclosed in the reservoir. A similar diaphragm, but of much smaller area, allows a very small quantity of gas to stream continuously into the cylinder, and as this current is not interrupted by the closing of the induction valve, its little jet burns constantly, and is always ready to ignite an entering charge. Should the gas by any anticipated accident reach the reservoir, the expansion of the confined gas consequent upon its explosion will, it is affirmed, simply open the safety valve, which is given considerable area, and no harm is done. The additional precaution, however, is taken to make the walls of the reservoir very strong. The thorough mixture of air and gas to insure complete combustion is accomplished by taking the illuminating gas and air, in proper proportions, into the compressing pump together, and the mixture here made becomes more intimate in the reservoir, and in its progress towards the place where it does its work. Where a liquid hydro-carbon (crude petroleum, for example) is employed in place of gaseous fuel, as was the case in the engine exhibited at the Institute, the reservoir is filled simply with air, and the carburation takes place at the point of combustion. In this arrangement, it will be observed, the explosive compound is not formed until it arrives at the combustion chamber, a disposition which renders it possible to work with but a very minute quantity of liquid in the apparatus at any one time, while at the same time an explosion in the reservoir is rendered impossible.

QUICK WORK.—The order for seventeen powerful "consolidated engines," requiring twice the work of an ordinary freight engine, was given at the Altoona shops, Pennsylvania railroad, on November 8th, and on Saturday, December 11th, they were all on the road ready for business—a feat in mechanism truly remarkable. The engines each weigh 95,000 pounds.

Steel vs. Iron Rails.

The influence exerted upon the market by the introduction of steel rails is becoming more and more apparent every day. In allusion to this matter the Cincinnati Times says: "The continued depression of the iron market, not only in this country but also in Europe, is a subject for thoughtful consideration. The wonderful growth of the iron production of the world, from 1835 to 1865, marked it emphatically as the iron age; and during that period was built almost our entire system of railroads, covering over 73,000 miles of track, and requiring 7,300,000 tons of railroad iron in its construction. The annual wear and tear, estimated at ten per cent., would require 730,000 tons per annum of railroad iron. Since 1865 Bessemer steel rails have been growing in favor and decreasing in cost, and to-day the Bessemer plants of this country are capable of producing 350,000 tons of steel rail per annum. When it is remembered that each steel rail possesses fully seven times the life of an iron rail, it is to be wondered at that so many of our iron rail mills are churning their production to merchant bars? Every ton of Bessemer steel rails that has been put into the railroads of the country for the past ten years has possessed a wearing life, as compared to iron rails, as seven to one. It requires very little calculation to estimate the required production of steel rails, not only to cover the entire wear and tear of all our roads, but in a few years to replace our iron roads with steel rails. When this is accomplished there will only be required 73,000 tons per annum to supply the wear and tear that in 1865 required 730,000 tons of iron. This will account in part for the decreased production of pig iron in the country for three years past. In 1872 there were produced 2,854,558 tons of pig iron; in 1873, 2,869,278 tons, and in 1874, 2,689,413 tons—a falling off of about 16 per cent. in the production of pig iron in two years. This was fully equalized by the low wear and tear of steel rails that had gone into the railroads since 1865."

Experiments With Iron.

The well known French chemist, M. Gailletel, has continued his researches into the absorption of hydrogen by iron, with some interesting results. It appears that when an iron plate is attacked by sulphuric acid being poured over it, a portion of the hydrogen produced is absorbed by the metal, and the pressure of the gas which is accumulated between two iron plates, welded together, is sufficient to counterbalance a column of mercury thirteen and three-fourth inches high. This singular property of hydrogen, which has also been confirmed, lately, by the investigations of M. Sevois, is regarded by the latter as a most interesting discovery, and he attributes to the presence of carbonic oxide, or hydrogenized gas, the brittleness which some classes of iron manifest when an attempt is made to draw them into wire—a fact well known to workers in this metal.

It is also found that when decomposing by the galvanic battery a solution of chlorate of iron to which sal ammoniac has been added, metallic iron may be collected at the south pole in the form of a brilliant wart, brittle and often hard enough to scratch glass. This iron, after being washed, evolves, either under water or another liquid, numerous bubbles of a gas, which is pure hydrogen. When freely exposed to the air, galvanic iron loses only a portion of its hydrogen; under water, especially water heated to 140 or 150 degrees, the hydrogen is given off with violence. As to the quantity of hydrogen iron thus treated can take up, it seems that, for one volume of iron, the amount is two hundred volumes of gas: in weight, thirteen parts of iron absorb one part of gas. When a lighted match is applied to this iron, saturated with hydrogen, the gas burns like alcohol.

THE BRITISH CHANNEL TUNNEL.—This gigantic enterprise seems to be constantly gaining strength in the minds of both engineers and capitalists. It has recently secured the countenance and assistance of M. Ferdinand Lesseps, to whose persistent energy and undiminished courage the world is indebted for the Suez canal. M. Lesseps has presented a memoir on the projected tunnel to the Academy of Sciences, in which the result of the recent survey is very favorably reviewed. The sinkings at both extremities of the proposed cutting brought to light a dense stratum of chalk at a convenient depth, and the formation had been carefully traced, in an almost methodical course, from the French to within a short distance of the English shore, when further operations were discontinued owing to the severity of the weather. This work will be finished in the beginning of next year; and if, as is confidently expected, no insuperable obstacle presents itself, the horizontal boring will then be commenced. That will offer no difficulty, for infinitely harder rock than the most compact chalk can now be easily pierced, and from the uniformity of the material, the total cost of the work may be the more accurately estimated. The commercial, indeed, is now the only unsolved problem; and it is satisfactory to know that M. Lesseps has no doubt on that point. He is confident that the number of passengers who may be expected to travel annually between Paris and London will reach at least a million, and this number, at only \$2 each fare, would give a yearly income of \$2,000,000 from the profit on passengers' fares alone.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

California.

ALPINE.

BALAKLAVA.—*Alpine Chronicle*, Jan. 8: Work on this mine is to commence within a few days. This may be prompted by the United States mining act. Although the owner of this claim says he does not believe any person is so mean enough to relocate the Mountain mine, yet this contemplated move looks as though he is afraid to leave his own property to the cupid of some person who might be just mean enough to accidentally turn up, when least expected, and confiscate it. It makes a great difference whose hill is around about those times.

CALAVERAS.

RICH QUARTZ.—*Calaveras Chronicle*: The Champion mine at West Point, in this county, owned by Messrs. Haskins & Hadley, continues to produce largely. In fact, we have no knowledge of any other mine in the States that produces richer rock than the Champion, neither do we know of one that yields better, considering the comparatively limited scale upon which it is worked. The result of a recent clean-up fully maintains the reputation of the mine. Fifty tons of ore were put under the stamps, producing \$6,000—an average yield of \$120 per ton. And that is not an exceptional production for the Champion. None of the quartz extracted—from the surface down to a depth of 180 feet—has paid less than those figures, while some of it has exceeded them considerably. Notwithstanding the large amount of money that has been taken from the mine it is yet really undeveloped. But little work has been done on the main ledge, nearly all the ore extracted having been taken from a "spur" or "stringer." We understand that operations will soon be commenced on the principal vein, when we look for a large increase in the production of ore and bullion from the Champion.

GWYN MINE.—The work of running the 1100-ft levels in the Gwyn mine has been commenced and is being prosecuted with energy. The mine is now entirely free of water, the pumps working nicely, and no further trouble is apprehended on that account this season. The 1000-ft stopes continue to yield the usual quantity of good ore, and the mills are kept constantly employed. There is an abundance of ore remaining in the 1000-ft stopes to keep the stamps busy while the lower levels are being opened. The mine is now supplied with powerful hoisting and pumping machinery and ample milling facilities, and its prospects were never more flattering than at present.

GLENCOE DISTRICT.—THE GRASSHOPPER MINE.—The company recently incorporated as the Grasshopper mining company are now reopening this valuable mine, which has been lying idle for several years. It is situated in the western end of the village of Mosquito. Adequate steam hoisting works were recently put up over the old main shaft, which is not quite 100 feet in depth. The mine is well known for the extraordinary uniform richness of its ore, which exceeded even that of the Champion in the West Point district. The rock is of a dull white color, yielding magnificent specimens at times. The trend of the vein is north and south, conforming with that of the country rock (slate) on the west side. East of the fissure, and extending east about two miles, to within a short distance of the Poorman mine, the country rock appears to be slightly tilted, and the numerous valuable veins in the area of the apparent dislocation trend in an east and west direction, deviating probably twenty degrees from the trend of the country rock.

The Rickman mine, which is enriching its owners, is a strong east and west vein. Its works are 200 yards east of those of the Grasshopper. Glencoe district has furnished a generous quota of amalgam ever since we can remember, which has been rapidly increased within the past year. But little low grade ore (rock milling less than \$15 per ton) has been worked so far, on account of the meagre milling facilities. If the companies who have recently acquired possession of several of the best mines of Glencoe district have sufficient pluck to carry their properties through the proper primary stages of systematical development, the district will easily double its gold product this year.

INYO.

COSO CONSOLIDATED.—*Coso Mining News*, Jan. 14: Work in the Bella Union mine—one of this company's—is being driven ahead as fast as possible. The drift on the lower level is being pushed steadily along, and as yet there is no diminution of the ore, in fact the mine is daily improving, and the developments are such as to prove that our mines are truly wonderful in breadth and richness of ore. The Coso Consolidated company commenced hauling ore from the Bella Union mine on Tuesday last, to their furnace, and as they have a good supply of coal on hand, they will soon commence the shipment of bullion.

DEFIANCE FURNACE.—This furnace is running as well as any furnace ever did, and as well as is necessary for the speedy and rapid reduction of ore and the manufacture of bullion. It has not ceased for a moment since our last report, nor met with the least accident.

Under the superintendency of P. Reddy, Esq., the mine and furnace property of this company is being developed in a most rapid and wonderful degree.

NEW COSO MINES.—The works at the mines of this company are pushed with great energy and vigor. In our last visit to the Christmas Gift and Lucky Jim we were astonished to find quite a little town. Every day improvements of all kinds are taking place. The company has lately built a large and comfortable boarding house for the comfort of their employees—also an office for the foreman, where are kept a plan and drawing of all the workings of the mines—powder magazine and storehouse.

KERN.

MINING INTERESTS.—*Cor. Southern Californian*, Jan. 14: Havilah in the last year has not come up to the expectations of many of the speculators who were expecting another period of excitement, where every stratum and barren quartz ledge was sold for a mine, others who have been quietly working their ledges are quite satisfied with the result. We still have two country stores and the same number of hotels that cannot be excelled this side of the bay, all of which are doing a good business. The tardiness of San Francisco capitalists to invest here can only be accounted for in the failure of former companies, who crippled themselves by paying enormous sums for the privilege of demonstrating whether they had purchased a mine or not. The mines of Kern, like her rich lands, will not always be overlooked; all the practical miners that have visited Havilah in the last year agree in saying that in no part of the State can richer or more accessible mines be found; freight at any time of the year will not exceed two cents per pound from San Francisco to the mouth of the mine; a healthy and moderate climate, wholesome water and timber in abundance; labor as cheap as in any part of the mines—in fact, nothing seems to be needed but a little money and a good deal of energy. We have proved this in the last five years, in every instance where parties have done a reasonable amount of work they have been well paid.

MARIPOSA.

COUNTY MINING ITEMS.—*Cor. Tuolumne Independent*, Jan. 7: The old French mill, on the creek below the village of Coulterville, with its 50 stamps, is and has been pounding rich rock from the mine on Black creek. This is the Ralph Jones mine, or the one that gentlemen sold to the company some time ago for the sum of \$10,000, as I learn from some of his neighbors. There are a large number of rich lodes in this section of country. The Banderita mine, on the north fork of the Merced river, is paying handsomely. This is the old Goodwin mine, and has been worked profitably about 20 years. Operations on the following mines, in the vicinity of Gentry's gulch, are suspended until spring: These are the Coward mine, the Walden mine, and some others of lesser note. Mr. Sculan, at the junction of Gentry's with the north fork, is grinding very rich rock by the arrastra process. He tells me that he intends to put up one of the latest improved mills. In spring, things will be in readiness about these mines, and the different companies will commence to develop them at an early day; so times promise to be lively in this neighborhood in 1876. There is also some talk of opening the Marble spring mine, near Bull creek; the rock crushed from this mine was very rich, but it is a very expensive mine to work, the water in it being very troublesome, and the difficulty of tunneling through the hard rock to drain it is very great; but I believe that it will be a fortune to the owners when thoroughly opened. There are also other mines in that vicinity that will pay largely when properly managed, and the Skunk Gulch mine is one of them. The last named mine is owned by John A. Hite, owner of the celebrated mine at Hite's cove. Quartz mining is the chief industry of Mariposa county, and yet it is not half as rich in mineral wealth as Tuolumne and Calaveras counties. But quartz mining is followed with greater vigor in the former than in the latter named counties; and the only reason I can give is, that placer mining in Tuolumne and Calaveras counties paid better than in Mariposa in days gone by; consequently the miner turned his attention to quartz mining at an earlier date here than in the other two counties. The fact is, quartz mining in Tuolumne is only a sucking baby—that is all.

PLACER.

CLEANED UP.—*Placer Herald*, Jan. 15: The Auburn gravel mine made its third clean-up last Saturday. We have been unable to obtain particulars regarding the result, but from what information we have, it seems the yield this time, in proportion, was even better than previously. This is accounted for by their present proximity to what, in hydraulic mines, is known as the channel, by which is understood the greatest depression in the bed-rock, the miner invariably expects to find it the best pay. This mine, it is not supposed, will prove an exception, and therefore we may reasonably expect to continue to hear of favorable returns.

GOOD FRIDAY.—A sample rock lies before us from the Good Friday mine, located a few miles west of Auburn, which shows free gold profusely. The developments of this mine, which is now under the superintendency of J. M. Bryan, are very encouraging. The main shaft is down we learn one hundred and sixty feet, as deep as the present machinery will admit. The ledge is from eighteen to twenty-four inches thick, and the rock yields well, the last crushing of eight tons turning out \$1,080.

Such results indicate that the Good Friday, which heretofore has attracted but little notice, will soon rival the famous Crater.

TUOLUMNE.

MINING ITEMS.—*Tuolumne Independent*, Jan. 18: The Riverside mine has started up again. The Soulsby mine cleaned up over nine thousand dollars for the last month's run. John Conlin, on Experimental hill, near Columbia, has struck an exceedingly rich vein of quartz about four feet wide; down in the gulch they have struck the same vein at a depth of eighty feet. The gold sticks out of the quartz in every piece in big chunks. It is the richest ore we have seen. Some of the quartz is crystallized and the gold is massed in the crystals. He has taken S. W. Pitts as partner, and they intend to haul some of it to Thurman's mill to test its average yield.

Nevada.

WASHOE DISTRICT.

BULLION.—*Gold Hill News*, Jan. 13: Sinking the main incline is progressing finely at the rate of five feet per day. The upraise from the 1,700 ft level to connect with the bottom of the incline is ascending at the rate of from five to six feet per day. The Burleigh drills in use in this raise are doing splendid work. The northeast combination drift on the 200-ft level is steadily advancing, the rock in the face gradually softening and showing streaks of quartz, indicating a nearer approach to the main ledge.

KOSUTH.—A drift west from the bottom of the winze at the 300-ft level is in a distance of thirty-eight feet, the face in a fine quality of white quartz, very much resembling the ores of the Consolidated Virginia and Ophir. This quartz affords excellent assays, mostly in silver, and the indications of a paying body of ore are daily growing more encouraging.

NEW YORK CONSOLIDATED.—Raising up on the third compartment of the shaft is making excellent headway. The prospect of finding pay ore on the 800-ft level is growing better, and giving great encouragement to the stockholders. It is confidently believed that the development of another rich body of ore to the east of the Belcher and Overman is only a matter of time; and if so, the New York will certainly be one of the first mines to find it.

BELOREA.—Daily yield 450 tons of ore. The ore breasts and stopes show but little, if any change during the week, the ore continuing of a good character, and being shipped to the mills for reduction as fast as it is extracted. The water is nearly drained from the 1600-ft level, ready to again resume work in that portion of the mine. The air shaft is completed down to the 1500-ft level.

JULIA CONSOLIDATED.—The main south drift on the 1400-ft level is being advanced five feet per day, the ore prospects in the face gradually increasing as the drift enters the ledge.

CONSOLIDATED VIRGINIA.—Daily yield 600 tons of ore, keeping the mills all running up to their full crushing capacity. The ore breasts are all looking well and yielding rich ores as usual. The crushing capacity of the mills will be increased in a few days, which will add over \$800,000 a month to the yield of the mine, or \$2,500,000 per month.

LADY BAYAN.—A fine ore prospect has been developed by the north drift on the 380-ft level. This discovery is in entirely new ground, and is a very important one. Some assays of the ore run as high as \$300 to \$780 per ton, mostly silver. The extent of this ore body is not yet known, but promises to exceed by far anything yet found in the mine. The winze being sunk below the 250-ft level, to connect with the south drift on the 380-ft level, is also showing some fine ore. The course of the ore vein going south is gradually verging more to the westward, and, in the opinion of some, will eventually assume almost the east and west course of the Cannan, and may yet prove itself a branch of the Comstock. Sinking the main shaft is going steadily forward, the bottom in fine quartz, with rich ore coming in on the north, the ore being very similar to that found on the 380-ft level above.

OPHIR.—The water is all drained from the bottom of the main shaft, and the sump is being cleared out and the timbers repaired. The drifts and other stopes have all been re-timbered and put in good working order down to within 30 feet of the 1600-ft level.

CALIFORNIA.—The main north drift on the 1550-ft level is steadily advancing toward the south line of the Ophir, the entire length of the drift being in fine ore. The face of this drift continuing in rich ore is adding vastly to the already known wealth of this famous mine. No other prospecting is being done on the lower levels at present. The California mill has been tried sufficiently to find that everything in connection with the structure works with the utmost perfection. The batteries are being "puddled" with ore previous to setting the whole in motion, and it is expected that the mill will be ready to commence crushing regularly in four or five days more. Sinking the C. & C. shaft is making splendid progress, the rock in the bottom blasting out finely and the work being pushed ahead with all the energy possible. It is now down 995 feet.

LEE.—This mine is situated in the easterly portion of the great Comstock belt, adjoining the famous Lady Washington mine on the north. It is one of the old locations which, after some time spent in securing its title and getting into the hands of men of capital and mining energy, is now in process of good, square, practical development. Excellent and effective work is being done.

MINT.—Sinking the main shaft is making excellent headway, the bottom in good working ground. It is now down 995 feet, and by Saturday will have attained a depth of 1,000 feet. When that point is reached it is the intention to suspend the sinking for a few days, in order to put in ladders and stations, reaching from the bottom to within about thirty feet of the surface, in order to make a way of escape from the shaft for the men in case of fire or other accident. Thirty feet below the mouth of the shaft a tunnel will connect with the ladder-way, so that even should the hoisting works burn down the safety of the men in the mine would still be secured.

NORTH CONSOLIDATED VIRGINIA.—Sinking the shaft below the 630-ft level, to make room for a pump before putting out for a station, is making excellent progress. The bottom of the shaft is showing an increase of quartz feeders. The feeders or stringers all have a strong dip to the east, indicating that the principal ore vein lies in that direction.

AMAZON AND GLASGOW.—The joint shaft of these mines has been sunk to depth of 429 feet below the croppings, during which time two levels have been opened ready for a thorough exploration of the ledge at each point. The third level is now opened, and a cross drift has been started to cross-out and prospect the ore vein.

GLOBE CONSOLIDATED.—A new and valuable discovery of fine ore has been made in a cross-cut west of the old incline in the upper works. This body of ore assays high in silver, being different in that respect from any that has yet been developed in the mine. The extent of the find cannot yet be known, but there is every indication of a good sized ore body being developed.

UTAH.—The new pumping and hoisting machinery will be ready to start up in about two weeks' time.

BEST AND BELCHER.—The retimbering of the Gould & Curry shaft still prevents the extraction of the water from the 1700-foot level, and the resumption of work in that portion of the mine.

GOULD & CURRY.—No work can be done in any portion of the mine until the shaft is completed and the water extracted.

SULLIVAN.—South drift at the adit level in 49 ft from the shaft station. Material the same live, true fissure Comstock ledge matter heretofore mentioned, heavy with sulphurets. Some small streaks of this assay very richly and indicate very conclusively what will be found at a lower level, or even what may be met with at the present level by the same drift.

ORIGINAL GOLD HILL.—Bad roads have somewhat interfered with the hauling and milling of the ore during the week, but not the production from the mine, 20 tons per day being the yield from the main south ore body. The stopes and breasts hold out well, and a raise is being made above the main tunnel level, in the north portion of the ore body, to ascertain its extent in that direction.

CROWN POINT.—Daily yield, 425 tons of ore. This ore is taken from the old ore stopes, and is of low grade, in fact, but little more than pays the expenses of mining and milling.

BALTIMORE AND AMERICAN FLAT.—Sinking the main incline has been resumed and is making excellent progress, the bottom in good working ground. The water tank at the 1050-ft station is completed, and the heavy pumps are being lowered into position ready for use when needed.

SERRA NEVADA.—Sinking the new shaft is making steady and favorable progress. The west drift at the 1250-ft station is being pushed rapidly forward to cut and prospect the ore vein.

YELLOW JACKET.—The timbering of the connecting drift between the north and south winzes on the 1940-ft level has not yet been completed. A cross-cut has been started from the bottom of this winze to cut and prospect the ore vein.

PROSPECT.—Streaks of fine looking quartz and clay are being passed through, and the diamond drill is doing very satisfactory work. The main tunnel of the upper workings is driving ahead lively, and at present is passing through streaks of ore which give high assays, over one-third of which is gold.

SOUTH COMSTOCK.—Cross-cut 327 ft in length to-day. During the week a horse of very hard porphyry has been passed through, and the face is now in clay, quartz and soft ledge porphyry of a very favorable nature. The hard as well as the soft streaks have a well defined and decided dip to the east in accordance with the regular Comstock formation.

EUROPA.—The east wall of the ledge has been reached by the west drift on the 320-ft level, and two drifts, one north and the other south, have been started along the east wall of the ledge so as to open a considerable length of the vein before cross-cutting.

LEO.—The south drift is now in 72 ft. A cross-cut has been started from this drift to the east, the face of which is also in ore of a fine character.

IMPERIAL-EMPIRE.—Daily yield, 40 tons of ore. The ore breasts are looking well and the prospects are good for a fair yield for some time to come. The ore indications on the 2000-ft level are steadily on the increase.

JUSTICE.—The stopes and breasts of the 600 and 400-ft levels continue their good ore yield and showing, and good progress is made with the drift south of the 800-ft level, the face being in very favorable vein matter, giving low assays.

OVERMAN.—The main south drift on the 1100-ft level is steadily advancing with more and more favorable ore indications.

LAST month 2,088,329 pounds of hullion, and 2,472,458 pounds of silver ore were shipped over the Utah Southern railroad.

NAME OF COMPANY.	JAN.		FEB.		MARCH.		APRIL.		MAY.			JUNE.			JULY.		AUGUST.		SEPT.		OCT.		NOV.		DEC.	
	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.	H.	L.
Phil. Sheridan.....	7	1½	2	¾	1½	1½	1½	1½	1	1	1	¾	1½	90cs	2	1	1½	¾	1½	¾	¾	¾	1	¾	1	¾
Pictou.....	1½	¾	¾	¾	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	40cs	.....	.....	.....	.....	.....	.....	.....	5cs	5cs
Pioche.....	5½	3½	4½	4	6½	8	6	8	4	2	3½	2½	4½	3	4	4	¾	¾	1	¾
Pioche West Extension.....	.....	.....	.....	.....	1½	1	5½	1	3½	3	2	2	4	4	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Pioneer Con.....	.....	.....	.....	.....	1	1	2	1	2	1½	2	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Prosser.....	2	¾	4½	1	5½	3½	9	8½	13½	7½	10	6	6	2	4½	2½	2½	1	2½	¾	1½	¾	¾	¾	¾	
Promont.....	.....	.....	.....	.....	2½	2	3½	2	4½	4½	4½	4	4½	4½	19½	3½	6	2½	6	3	4½	4½	0½	4½	.....
Prussian.....	3½	1½	3½	¾	4½	1½	3	2½	4½	8	3	2½	2½	1½	2½	¾	.....	.....	2	1½	2	¾	2½	1	.....
Pauper.....	.....	.....	.....	.....	.....	.....	.....	.....	8	2	3	1½	30cs	¾	30cs	28cs	.....	.....	.....	.....	.....	.....	.....	.....	.....
Panther.....	.....	.....	.....	.....	.....	.....	.....	.....	2	1	1½	1½	1½	1½	1½	¾	2	1½	1	¾	¾	¾	1½	¾	¾
Phoenix.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2½	1	2½	1½	2	1½	.....	.....	1	1	.....	.....	.....	.....	.....
Laymond & Elv.....	45	22	43	25	77	40	67	40½	67	40½	45	34	62½	45	52	52½	31	25	33	24½	28	14	22	13½	.....
*Rock Island.....	15	8½	4½	2½	6½	6½	7½	4½	7½	4	11½	5½	4	2½	5½	3	3½	2½	3	2	3½	2½	4½	3½	.....
Rio Patch.....	4	3	4½	3	4	2½	3	1½	2	1½	2½	1½	1½	1½	1	¾	1	¾	1	¾	1½	¾	¾	1	¾	
Savage.....	190	85	120	75	144	110	138	120	135	90	109	84	145	85	160	81	80	62½	90	58	116	62	22	12,86	.....
Scorpion.....	5	1½	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Seagraved Belcher.....	165	100	125	60	115	80	110	97½	105	80	90	70	101	75	105	57	61	62½	77½	40	87½	60	50	80	.....
Seagraved Caledonia.....	1	¾	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sea, Rock Island.....	2	1	1½	¾	1	¾	1½	1	1½	1	1	90cs	1	¾	1½	¾	¾	¾	60cs	60cs	¾	¾	.....	.....	.....
Senator.....	2½	¾	1	¾	1	¾	1½	70cs	.....	.....	¾	¾	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sierra Nevada.....	27	12	15½	10½	15	11½	14	11½	14	9	18½	11	20	12½	21	14½	14½	11½	16	12	19	9½	22	16½	.....
River Cord.....	.....	.....	2½	2	2½	1½	2½	2	.....	.....	4	2½	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Silver Hill.....	18	9	12	6½	13	6	13	9½	13	8½	9½	6½	11½	6½	13	7	9½	5½	12	7	10	6½	10	7½	.....
Silver Peak.....	.....	.....	.....	.....	.....	.....	¾	¾	.....	.....	1	1	.....	.....	1½	1½	.....	.....	.....	.....	.....	.....	.....	.....	.....
Silver Central Con.....	.....	.....	2½	1½	2½	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	¾	¾	.....	.....
South Chariot.....	1½	¾	2	¾	2½	1½	2½	1½	3½	¾	3	¾	1	¾	80cs	¾	85cs	22cs	¾	10cs	¾	20cs	¾	¾	.....
South Cometstock.....	3	3	2	2	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
South Justice.....	8½	6	8½	6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	2	4	2
St. Patrick.....	.....	.....	.....	.....	2½	¾	.....	.....	.....	.....	2	1½	.....	.....	1½	1	2½	1	2½	2½	.....	.....	.....	.....	.....
Sacoor.....	9	4	4½	1½	1½	¾	1½	¾	1½	1	1½	¾	1½	¾	1½	¾	1	¾	1½	¾	1½	¾	1	¾	.....
Sutro.....	3½	1½	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1½	¾	.....	.....	.....	.....	.....	.....	.....	.....	.....
South California.....	.....	.....	.....	.....	.....	.....	.....	.....	2½	2	3	1½	.....	2	4	2	.....	.....	.....	.....	2	2	2½	1½	.....
Seg Gold Hill.....	.....	.....	.....	.....	.....	.....	.....	.....	2	1½	¾	¾	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
South Overman.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	15cs	15cs	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
South Mountain.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	3	2½	3	¾	.....	.....	.....	.....	.....	.....	.....	.....	.....
South Star.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	1	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Santa Rosa.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1½	1½	.....	1½	1½	.....
Trunch.....	15	10	6	6	6	¾	.....	.....	6	6	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	7	7	.....	.....
Tyler.....	¾	¾	¾	¾	¾	¾	65cs	60cs	¾	80cs	¾	60cs	¾	80cs	¾	¾	¾	¾	.....	.....	.....	.....	.....	.....	.....
Tyler.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	1	¾	¾	¾	¾	¾	.....	.....	.....	.....	.....	¾	¾	.....	.....
Tybo Consolidated.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
*Union Consolidated.....	95	10½	12½	6	11½	7	9½	8	8½	5	7½	5½	10	6½	11½	7	9	6½	10½	8	10	7	10½	8½	.....
Utah.....	11½	4½	8½	3	7½	3½	6	4½	7	6	6½	3	19½	4½	15½	11½	10	0½	14	6½	15	6	17½	13	.....
War Eagle.....	1½	1½	2½	1½	6	1½	6½	4½	5½	2½	3½	1	1½	¾	1½	1	1½	1½	¾	.....	.....	.....	.....	.....	.....
Ward.....	7	4	4	3½	3½	3	3½	3½	.....	.....	.....	.....	3	2½	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Washington and Oreion.....	1½	¾	¾	¾	1½	¾	1½	1	1	¾	1	¾	.....	.....	¾	¾	.....	.....	.....	.....	.....	.....	.....	.....	.....
Webfoot.....	.....	.....	1	¾	1	¾	¾	¾	¾	¾	40cs	¾	2½	62cs	¾	¾	.....	.....	.....	.....	.....	.....	.....	.....	.....
Wells Fargo.....	1½	90cs	1	¾	¾	20cs	35cs	20cs	¾	¾	20cs	10cs	¾	15cs	65cs	¾	¾	10cs	35cs	10cs	35cs	11cs	30cs	20cs	.....
Whitman.....	.....	.....	1½	1½	.....	.....	.....	.....	.....	.....	.....	.....	.....	2½	2½	2½	2½	2½	2½	2½	.....	.....	.....	.....	.....
Woodville.....	6½	3	6	2	4½	2½	3½	1½	3½	2½	3½	1½	3½	1½	3½	1½	2½	80cs	4½	1½	8½	1½	4½	1½	.....
Washoe.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	¾	¾	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
West Point.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
West Almaden.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	2	.....	.....	.....	.....	.....	.....	.....	.....	.....
West Belcher.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....	2	2	2½	2
Yellow Jacket.....	17½	87	105	66	103	71	95	80	85½	72	79	70	95	72	103	63	68½	50	89	60	90	60	115	82	.....

USEFUL INFORMATION.

The Formation of Habits.

We are all familiar with the process. A movement, or series of movements, at first painfully difficult and requiring the whole thought and attention, by repetition become so easy and semi-automatic that attention is no longer necessary. The most remarkable examples of these, such as walking, speaking and the like, probably belong partly to the third category; the capacity for these is partly inherited. Playing on a musical instrument is therefore a better example. We all know the painful attention necessary at first, and the ease and rapidity of the most complex movements attained by practice. Now, by what means, anatomical or physiological, do these at first difficult movements become, by repetition, easy? The answer in general terms, seems to be this: Every volitional act is attended with a change in the brain, which, however slight, is liable to be affected by subsequent changes, and therefore evanescent. If the same act, however, be repeated many times, the change becomes deep and permanent—becomes petrified in brain-structure, whatever be its character or its seat, determines the appropriate acts with precision. It is as if every volitional act produced a faint line, liable to be erased, on the tablets of the brain; by running over the same lines many times these are deepened into grooves and finally into ruts, and motion in these becomes easy and certain, because the ruts guide the motion instead of the will. The repetition produces structure and structure determines habit.

SMOKE PREVENTER.—A new fuel-saver and smoke preventer, us it is called, was first shown in public in Cincinnati the other day. The principle on which it acts is as follows: A current of air is forced by means of either a syphon or a fan through distributing pipes, three in number. The first of these pipes is located in front and under the grate bars, thus forcing the air through the grate. The second pipe is placed above the fire-door, blowing the air into the fire. The third is on the bridge wall, blowing the air forward. The three pipes combined entirely prevent the formation of smoke. It is claimed for this invention that it can be successfully applied to steamships, steamboats, locomotives and even to stoves.

LEAVES of the pine-apple, now being extensively cultivated in the East Indies, are turned to account by being converted into a kind of wadding, which is used for upholstering instead of hair. A sort of flannel is also manufactured from them, from which substantial waistcoats and skirts can be made.

WHAT are they adulterating coffee with now? While Mr. Naugle, of New York, was heating some the other day it exploded, scalding his entire countenance.

Important Postal Decision.

Many merchants in various cities of the country having been in the habit of sending out papers devoted to special interests, in their own name, printed boldly on the wrapper, addressed "in the care of" their customers, at the regular pound rate chargeable on daily papers, the question was submitted to the Postoffice Department, and the following decision has just been rendered:

"That a newspaper or periodical sent by mail to a regular subscriber implies not only the name of the subscriber, but his residence or place of business also. When a subscriber is temporarily absent there would be no objection to sending his paper at the pound rate to the place where he may be temporarily sojourning, but when papers are addressed to subscribers at places where they have no permanent or temporary residence or place of business, with an evident intention to defraud the government of the legitimate rate of postage to which such papers are subject, they should not be delivered until postage has been paid thereon at transient rates, notwithstanding they may be sent to the care of some other individual."

To soften hard gold pass chlorine gas through the molten gold, by which treatment most of the gold which had otherwise to be set aside as unfit for certain kinds of work, can be redeemed.

GOOD HEALTH.

Frost Bite.

Exposure to the cold, of severe degree, often leaves the fingers and toes, nose, ears and lips, more or less frozen. This condition, short of absolute death of the part, is termed frost bite. It will be observed that the portions of the body just enumerated are those most exposed, in area, to the influence of the cold, and are furthest situated from the heart; and it will, perhaps, be unnecessary to remark that persons who are debilitated are more apt to suffer with the same amount of exposure than the robust.

When the circulation of any part begins to succumb to the influence of the cold, it becomes puffy, blueish and smarting. This is because the blood moves more slowly than natural through the vessels exposed near the surface. Soon this blueness disappears, and the part becomes pallid, as if the influence of the cold had contracted the vessels to an extent incompatible with the passage of blood through them. The pain at this point ceases; indeed, until he meets a friend, his friend does not know of his mishap. At this stage the injury has become so great that, unless proper means are taken to restore circulation, complete death of the part ensues, and in due time sloughs away, and is detached from the line of living tissue.

What takes place in a part of the body, known as frost bite, may take place in the whole of it, which is known as "frozen to death." The

blood of the extremities being gradually forced from them, under the continued subjection of the cold, is forced inward upon the larger blood vessels, heart, lungs and brain. There is increased difficulty in breathing, owing to the engorged state of the chest, and, what should always be remembered by one so exposed to cold, an unconquerable desire to sleep. To sleep *then* is to die. If the person exhibits such a symptom, he must, by all means, be kept constantly moving.

Treatment.

Persons exposed like those just described must be treated promptly, and with one thing never lost sight of. That is, keep the frozen person away from the heat. A person taken up insensible, or approaching it, from exposure to the cold, should be taken into a cold room, his clothing removed, and thoroughly rubbed with snow, or clothes wrung out with ice water. The friction to every part of the body, particularly the extremities, must be continued for some time, until signs of returning animation appear. When the frozen limbs show signs of life, the person should be carefully dried; put in a cold bed in a cold room; artificial respiration used until the natural is established; then brandy given, also ginger tea and beef tea. Usually, by this time medical advice will have been secured to direct further treatment. should it not, do not forget that the patient is to be brought by degrees into rather warmer air; and lest in some part there might still be defective circulation, the person should be kept away from exposure to the heat of the fire.

Milder degrees of the same condition, as suspension of life in the ear, nose, finger, or toe from exposure to cold, must be treated with the same general directions in view. The part should be kept away from the heat and rubbed with a handful of snow, or towels dipped in cold water, until circulation appears re-established. Exposure of the part to the heat before, we may say, it has been almost rebuilt, is apt to be followed by sloughing.—*Accidents and Emergencies.*

CONSUMPTION.—The incurable character commonly attributed to pulmonary diseases is seriously questioned by M. Pietra Santa, the malady being, in his opinion, essentially general and constitutional—an alteration of the functions of nutrition, and a disease of the blood; und that, while there is no panacea for the affection, he thinks that many cases may be greatly alleviated, and, indeed, entirely cured by following a rational treatment. Thus, in all periods of the disease, the assistance is to be invoked of suitable hygienic and moral treatment, a pure atmosphere, a tonic diet, moderate exercise and the use of milk for food; the administration of certain mineral waters; a sanitary change of place and migration, always into southern temperate regions during winter, and to mountainous countries in the summer; the use of hyposulphites and the alkaline sulphites for the treatment of the tuberculous matter developed in the lungs; and calling into play the various agencies of therapeutics when they can be made available in the different periods of the disease.

DOMESTIC ECONOMY.

Remarks on Eating.

Professor Blot used to say it is a fact beyond all question that the intellectual and moral faculties of man are influenced in a large degree in their operations by those physical conditions which are dependent upon our food. Physiology proves that it is the contraction of muscles that produces wrinkles; and a person whose food is properly prepared appears younger and more beautiful than one who follows no scientific principles in his eating. Good food, properly prepared, will keep his muscles in order and elastic. Any one, male or female, young or old, starting with a good stomach, can keep healthy and in good flesh with proper food; it is only necessary to select the kind required by the constitution, and prepare it judiciously. It is not what we eat that makes us fat, but what we digest. Bad food may bring a temporary bloatedness, but not the plumpness of good health. He agreed with the opinion expressed by Thomas Jefferson, as well as by a celebrated New York clergyman, that good things have been made by the Creator for good people.

Another thing in food—it ought always to be prepared according to the age of the person for whom it is intended, and for the sex, as well as according to the climate and the season. In winter more fatty matter is necessary to be eaten than at any other time of the year. In spring, greens, which purify the blood and remove the bile occasioned by eating fatty substances in the winter. In winter we need more bile; in the spring we must get rid of it if we would be healthy. When warm or hot weather comes, we must supply the wasted system by eating meat. Meat is better in summer than anything else. It is a great mistake to suppose that vegetables are the best for this season of the year. He recommends roast beef for summer. Skim off the fat. Don't bring fat to the table.

The Borgias of our Kitchens.

Oh, woman! heaven's last, best gift to the kitchen, must you and your daughters still continue to marshal families the salarutns way to dyspepsia? Can you never learn that the grid-iron and the clear, glowing beds of coal, whereupon St. Lawrence himself would have deemed it a luxury to be broiled, better benefit the lordly steak unmacerated with the brutal pestle, uncontaminated with factory lard, and will sooner woo it to turn to pale pink, delicate amber and tender brown (with a sensitive elevation at the corners, forming a central chalice for the reception and preservation of its own juices) than the frying pan, accursed of God and abhorred of men? Know you not that by thinly slicing potatoes—*not* left over from yesterday's noon-day dinner—into cold water, wiping the same dry in a towel, dusting them with pepper and salt, frying them in boiling lard, and as soon as they put on the rich golden brown hue of a Cuban helle, removing and draining them, you can compass that which, at Saratogs, has brought fame and fortune to the artistic restaurateur? Is it not in you to pour boiling water on your coffee, and set the pot over a shovelful of embers in the hearth-box, where it will just simmer and not boil? Can your finer female sense not apprehend the difference between fanning a smokeless fire with a generous slice of bread till the surface of the latter turns delicately golden, then brushing the same with fresh butter, and burning bread on the top of a dirty stove, then swabbing it in melted, rancid oleomargarine? Alas! if experience can be relied on, woe, not. Priscilla is joined to her salarutns and frying pan; let her alone.—*The World.*

WHITEWASH FOR KITCHEN WALLS.—The first consideration in a cooking room is cleanness. Tried by this test, papered walls are an abomination in such a place. You cannot darken this room through part of the day in summer, as you do others, and consequently fly specks will be numerous. These walls absorb the kitchen odors and steam, and the smoke rests lovingly upon them. If creeping things get into a house they are sure to insinuate themselves into the paper on the walls. Hard-finished walls are really more cleanly, for they can be washed; but, unless the finishing is better done than in the kitchens we have seen, they soon look dirty, and this is the next worst thing to being so; for such finishing soon becomes discolored and "splochy." There is nothing that will compare with the old fashioned whitewash; not color wash, but whitewash, pure and simple. The color wash may give the walls a prettier tint, but it must be put on by a practical hand, whereas whitewash can be applied by any one, whenever a dirty spot makes its appearance. It is true that unpracticed hands do not apply the brush as evenly as could be wished, but a few streaks more or less don't matter, when we can all see that the streaks are white and clean.—*Scribner*.

POTATOES should always be put into boiling water to cook, boil quickly and pour off the water, letting them dry a few minutes over the fire before dishing up. Steaming is the best manner of cooking them.

INDIAN GIDDLES.—Two cups of meal, one of flour, one of milk, one of water, one egg well beaten, two teaspoonfuls of cream yeast, sifted into the meal and flour. Mix and bake on hot griddles.

MINING SCIENTIFIC PRESS

W. B. EWER, SENIOR EDITOR.

DEWEY & CO., Publishers.
A. T. DEWEY, OEO. H. STROBE,
W. B. EWER, JNO. L. BOONE

Office, No. 224 Sansome St., S. E. Corner
of California St., San Francisco.

Subscription and Advertising Rates:
ADVISING RATES.—1 week, 1 month, 3 months, 1 year.
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One inch.....1.50 4.00 12.00 40.00

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San Francisco:

Saturday Morning, Jan. 22, 1876.

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Aero-Gas Engine; Quick Work; Steel vs. Iron Rails;
Experiments with Iron; The British Channel Tunnel,
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MINING STOCK MARKET.—Sales at the San
Francisco Stock Board; Notice of Assessments;
Meetings and Dividends; Review of the Stock Mar-
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The Borgia of our Kitchen; Whitewash for Kitchen
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NEW ADVERTISEMENTS.

Mutual Benefit Life Insurance Company, Newark, N. J.,
Lewis C. Grover, President; Mining Superintendent,
E. B. Smith, S. F., Cal.; Engineer, W. H. Faunt-
leroy, Oakland, Cal.

HOUSEHOLD ELEGANCIES.—We have received
from Roman & Co. a useful little work on
"Household Elegancies," containing sug-
gestions in household art and tasteful home de-
corating, by Mrs. C. S. Jones, and Henry T.
Williams. It is profusely illustrated, and treats
in detail of the following subjects, assisting
the description with engravings: Transparenc-
ies for windows, lamps, balls, etc.; fancy
work with leaves, flowers, grasses, mosses, etc.;
spray work or spatter work; brackets, shelves
and mantels; picture frames; fancy letter
work; wall pockets; work boxes and baskets;
wax flowers, fruit, etc.; Indian painting in imi-
tation of ebony and ivory; cone, shell and
seed work; miscellaneous fancy work. This
little book will no doubt be thoroughly appre-
ciated by those ladies who delight in increasing
the beauties and attractions of home by de-
corating it with tasty devices of their own
handiwork.

P. W. JOHNSON & Co. have shipped from
Winemucca to Philadelphia, for the Centen-
nial, eleven boxes of ore specimens, weighing
1,117 pounds, from which it appears that others
beside the State Centennial Commission are
collecting minerals for the big show.

SENATOR JONES' Kernville mine is likely to
prove a second Comstock. An immense ledge
of ore easily assaying \$300 to the ton has been
discovered, and a body of ore which has been
estimated at 600,000 tons has been discovered.

THE Caribou mine at Central City, Colorado,
produced \$204,703 worth of silver bullion last
year, and is expected to do better the coming
season under increased development.

RICH copper deposits have been recently dis-
covered in the Walker river section, about forty
miles south and east of Virginia City. Nearly
\$50,000 worth of ore has been taken out.

It is reported that a rich vein of coal has
been struck near Santa Monica.

Mining Interests in 1875.

As we have kept a faithful record of every-
thing of interest pertaining to mining matters
for the past year, we do not consider it neces-
sary to go into details again at this time in a
lengthy mining review, but will briefly sum-
marize a few facts which bear on the result of
this year's work. We have increased the bullion
product in 1875 over that of any previous year.
The total yield in 1874 was \$74,401,055. This
year it was \$80,889,037.

Of course the great event of the year has
been the unprecedented yield of the famous
Comstock. Last year at this time every one
was excited on the subject of
mining, the wonderful developments on the
Comstock aiding in this and promising a
brilliant yield. Of course the estimates made
at this time were laughed at by many, but the
shrewd ones who placed faith in the calcula-
tions of the mining experts, and had the means
to invest on their recommendation have reaped
and are reaping their rewards.

Probably the greatest advantage of these dis-
coveries, aside, of course, from this wonderful
product of bullion, has been that they have
turned the attention of so many to the mining
interests of the country. Very often do we
hear the remark that "the mines have given
out," and that mining is more of a speculation
than an investment. Whenever stocks are
down the praises of agriculture are sung, and
the "honest miner" is laughed at as a vision-
ary and a thing only of to-day. Already are
some of the farmers in the interior thinking
that they will be able to stop the hydraulic
miners above them from working the mines,
alleging that the tailings are destroying their
farms and that the farms are the more valuable.
The miners, however, have priority of posses-
sion, common custom and common sense on
their side, and the question is one which a
single legislature will not be able to deal with.
Many people consider that the business of min-
ing is merely one of speculation and should
not meet with encouragement. The practices
of some few unscrupulous men have cre-
ated a distrust of mining enterprises among a
certain class of people who look upon the busi-
ness as being closely allied to horse racing or
gambling. They look with deference on the
"honest kings" who have made such im-
mense fortunes by their mining transactions,
but consider it altogether a piece of luck, for-
getting or ignoring the fact that it took
both pluck and money to develop the riches
which nature had placed in the ground for
whosoever would work for it.

Mining is by no means "played out," and
this year has given it such an impetus as it has
not had for a long time. True, the product of
California fell off last year, but the water sea-
son was a poor one. This year promises better
things, and if the Fryer process does halt which
it is hoped to, next year will see many a quartz
claim in this State which is now idle, turning
out the golden ingots to the markets of the
world. No man can look at the figures of pro-
duction and dividend, given herewith, and say
that an industry which produces so much is
not worthy of encouragement.

The argument of "extra hazardous," applied
to mining as a business, does not on investiga-
tion prove true. Other branches of business
make as many failures, but these are considered
to be in the ordinary course of trade. The
fallacy of this reasoning can be shown by an
extract from Dun & Co.'s commercial report,
which says: "The extent of business failures
in the United States, for the past three years
and nine months, was \$635,966,000 divided
among 20,000 manufacturers, shippers, mer-
chants, bankers, etc." Commenting on this,
a contemporary says:

"Now, let us consider the mining business
of our country. It is safe to assert that from
outside sources there was not during that time
exceeding \$20,000,000 invested in mines and
mining enterprises—possibly not more than
half that amount. Let us allow a liberal
margin for any and all losses sustained by im-
prudent investments in worthless mines and
machinery, or mismanagement, and state the
amount at \$5,000,000. Now, what has been
the result? From reliable data from the United
States government, we find that the product
of American mines has for years past varied
from \$60,000,000 to \$70,000,000 annually, and
for the present year it will probably be about
\$100,000,000. Let us take the same period in
which the failures are given, and for the three
years say our production was \$65,000,000 per
annum, and for nine months in the same ratio,
and we have the enormous total of \$260,000,-
000 of created wealth; deduct from this the
\$20,000,000 invested, which includes losses
mentioned, and it leaves \$240,000,000 as an
actual net product.

"Now, while the actual creation of this
amount has made many rich, yet this is a small
part of their wealth. We have yet to consider
their mining estates, which are of such mag-
nitude that any attempt to estimate their value
would be futile. If we say those are worth
thousands of millions, we can only conjecture
how many. The annual incomes of some indi-
vidual members of companies in San Francisco
range from \$5,000 to \$10,000,000. These
stand related to properties that have been fairly
developed, although they yield but low grades
of ore.

"We think there is no question but that

mining, properly conducted, is one of the snarest
ventures that can be engaged in. True, there
have been failures, but generally on account of
want of foresight, from mismanagement and
investing in worthless mines."

It must be remembered, moreover, that the
miners are necessarily producers, and as such
aid our trades and manufactures; they are as
great producers as the farmers, and much
greater in proportion to their number. When
one class of men in a few States and Territo-
ries can produce in a year a sum of nearly
eighty-one millions of dollars out of the ground
itself, they surely ought to receive every en-
couragement possible to renewed exertions.
We talk a great deal about the immense wealth
product of California, and its importance to
the State and nation. Of course every one will
acknowledge the importance of that, but many
deny that mining is of half the consequence.
In 1875 the value of the wheat produced in this
State was \$26,000,000, and the gold pro-
duction was \$17,753,151. When we con-
sider that without doubt there are five farmers
to one miner, the production per capita is
greatly in favor of the miner. Moreover, this
bullion product is only that passing through
the hands of Wells, Fargo & Co., while the
wheat was all carefully considered by the cus-
tomers house officials, flour mills and wheat
brokers.

In one thing, however, mining has now de-
cidedly the advantage, and one which it will
keep. It has capital on its side. Comparatively
little capital in large amounts goes into
agricultural pursuits, but this year has opened
the eyes of capitalists to the advantage of large
returns for investments in mining properties,
and capital no longer treads a desert. On our
big mines big works are the rule, and where
we used to erect ten stamp mills we now put
them up with sixty and eighty stamps. The
developments made in depth in many of
the mines have induced mining men to go
deeper with a surer hope of success. We no
longer scratch over the surface, and consider
a mine worked out if it gives out at two hun-
dred feet. In Nevada the shafts are many of
them below two thousand feet, and most of the
machinery lately put up is calculated to work
the mines at a depth of four thousand feet.

It was supposed at one time that by the regular
increase of temperature with depth, mining
below two thousand feet would be almost im-
possible, and so expensive as to be impracticable.
Practice proves this idea to have been fal-
lacious, for by our shafts and various other
means, the heat in the lower levels is decreased,
and the miners made more comfortable. Another
fact indicating the faith of capitalists in mining
investments, and proving that as a business
mining is gaining strength among us, is that the
mills now made are larger and heavier than
ever, the hoisting and pumping gear heavier
and stronger, and the buildings and surface
works are put up in a manner indicating that
the owners intend to work properly. Deep
mining—deeper than the world ever saw before,
is now being done, and the miners look with
as much confidence on working a four thou-
sand foot shaft as they do in the two thousand
foot workings to-day.

Bullion Product.

Naturally, we look to the results of the year
as the measure of the success of any business.
In 1874 the product was \$74,401,055, and last
year it was \$80,889,037. In 1873 the yield was
\$72,258,693, and was referred to as the largest
in one year in the history of the coast. The
accuracy of this statement has been questioned,
and the yield of 1853 referred to as being
greater. Dr. Linderman, Director of the U. S.
Mint, whose information is probably as reli-
able as may be had, names \$65,000,000 as the
amount produced in 1853, and that amount
was not exceeded until 1873, which was ex-
ceeded by 1874, and now again by 1875.

The returns for the year 1875 are \$6,487,-
982 in excess of 1874, as will be seen from the
following report of John J. Valentine, super-
intendent of Wells, Fargo & Co.'s express.

EDITORS MINING AND SCIENTIFIC PRESS: We enclose
you herewith a copy of our Annual Statement of Precious

Statement of the amount of Precious Metals produced in the States and Territories west of the Mississippi river during 1875.		Total.	
States and Territories.	Amount.	1874.	1875.
California.....	\$1,847,010	\$1,847,010	\$2,300,231
Colorado.....	769,183	769,183	35,432,230
Idaho.....	74,517	74,517	1,155,635
Montana.....	1,168,698	1,168,698	1,830,000
Nevada.....	2,293,609	2,293,609	6,973,603
Utah.....	43,886	43,886	8,911,498
Arizona.....	22,000	22,000	6,299,817
British Columbia.....	2,027,412	2,027,412	2,408,671
Total.....	\$23,640,984	\$23,640,984	\$74,401,055

Metals produced in the States and Territories west of the Mississippi river, including British Columbia and the

West Coast of Mexico, during 1875, which shows an ag-
gregate yield of \$80,889,037, being an excess of \$6,487,982
over 1874, the greatest previous annual yield in the
history of the Coast. Nevada, Colorado, Mexico, Oregon,
British Columbia, Montana and Arizona increased,
while California, Idaho, Utah and Washington de-
creased. The increase is actual except for Mexico,
Oregon and Arizona, where it is apparent rather than
real, as compared with other years, a regular product
being accounted for and reported herein, hitherto
omitted. The decrease in California was in the main
accounted for by a stunted supply of water for placer and
hydraulic mining. The increase in Colorado and Nevada
is notable, also the fact that Nevada yields more
than half of the whole product of the country. Prof. R.
W. Raymond credits New Mexico (omitted in our state-
ment) and Arizona combined, with \$987,000 which is a
liberal allowance. We have been unable to obtain any
data that justifies a showing so favorable. The present
prospects indicate an aggregate yield of \$90,000,000 for
1876, of which Nevada will doubtless produce \$50,000,-
000. Respectfully yours,

J. J. VALENTINE, General Superintendent.

Nevada again heads the list and California
comes second. The increase in Nevada over
1874 is \$5,026,145. The decrease in California
has been \$2,547,380; Oregon has gained \$455,-
976; Washington has decreased \$73,603; Idaho
has fallen off \$325,102; Montana has gained
\$134,111; Utah has fallen off \$223,784; Arizona
has gained \$83,028, although we do not con-
sider the figures from that section as reliable
as others, as so much bullion goes through private
hands, of which Wells, Fargo & Co.
would have no account. Colorado has gained
\$2,108,412; Mexico has gained \$1,699,773.
The figures from Mexico cannot be considered
as full as they should be for the reasons given
concerning Arizona. British Columbia gave
\$140,396. The total increase of all over last
year amounts to \$6,487,982.

	1873.	1874.	1875.
California.....	\$18,062,923	\$20,300,231	\$17,763,151
Nevada.....	35,254,507	35,432,230	40,478,359
Oregon.....	1,376,339	609,070	1,165,046
Washington.....	209,396	155,535	81,932
Idaho.....	2,343,554	1,830,004	1,554,802
Montana.....	3,899,004	3,439,498	3,773,509
Utah.....	4,108,337	5,911,277	6,881,494
Arizona.....	47,788	26,066	10,093
Colorado.....	4,083,267	4,131,405	6,299,817
Mexico (West Coast).....	886,798	798,878	2,408,571
British Columbia.....	1,260,035	1,536,567	1,776,953

Totals.....\$72,258,693 \$74,401,055 \$80,889,037

This makes a total bullion product for three
years, including the west coast of Mexico and
British Columbia (which do not properly be-
long in the table), of \$227,548,785, a very good
showing for a productive industry.

The receipts of treasure in this city for 1875
is given as follows by Wells, Fargo & Co.:

FROM THE NORTHERN AND SOUTHERN MINES.		Gold Bars.		Coin.		Totals.	
1875.	Silver Bullion.	etc.	1874.	1875.	1874.	1875.	1874.
January.....	\$713,166	\$145,004	\$1,741	\$1,741	\$1,741	\$2,390,811	\$2,390,811
February.....	1,618,389	519,096	911,621	911,621	911,621	2,849,366	2,849,366
March.....	2,467,349	59,004	3,899,004	3,899,004	3,899,004	3,899,004	3,899,004
April.....	1,801,330	513,311	1,210,686	1,210,686	1,210,686	3,585,880	3,585,880
May.....	1,786,968	71,949	1,689,291	1,689,291	1,689,291	4,134,108	4,134,108
June.....	1,205,962	713,334	1,131,066	1,131,066	1,131,066	3,151,332	3,151,332
July.....	1,279,529	63,653	1,225,882	1,225,882	1,225,882	3,428,264	3,428,264
August.....	2,093,299	697,939	1,076,644	1,076,644	1,076,644	3,708,536	3,708,536
September.....	1,767,539	592,449	2,168,658	2,168,658	2,168,658	4,616,645	4,616,645
October.....	2,325,807	555,494	1,202,021	1,202,021	1,202,021	4,187,275	4,187,275
November.....	1,655,299	1,163,121	6,871,077	6,871,077	6,871,077	3,204,632	3,204,632
December.....	1,270,204	54,754	1,029,725	1,029,725	1,029,725	2,641,703	2,641,703
Total 1875.....	\$20,242,015	\$6,883,988	\$14,586,602	\$14,586,602	\$14,586,602	\$28,739,517	\$28,739,517
1874.....	\$18,062,923	\$7,092,923	\$9,239,353	\$9,239,353	\$9,239,353	\$34,324,230	\$34,324,230
1873.....	11,749,320	2,290,258	6,536,134	6,536,134	6,536,134	26,575,721	26,575,721
1872.....	6,386,794	1,434,849	6,169,611	6,169,611	6,169,611	20,000,000	20,000,000
1871.....	14,639,809	12,572,618	7,125,325	7,125,325	7,125,325	\$5,695,385	\$5,695,385
1870.....	14,639,809	12,572,618	7,125,325	7,125,325	7,125,325	\$5,695,385	\$5,695,385

FROM THE NORTHERN COAST.

1875.	Silver Buln	etc.	Coln.	Total.
January.....		\$181,938	\$ 37,023	\$222,021
February.....		45,027	243,394	288,421
March.....		105,681	159,741	268,052
April.....		136,182	65,004	201,786
May.....		96,176	81,186	183,322
June.....		44,428	37,065	81,493
July.....		119,533	34,221	153,674
August.....		85,714	51,658	143,462
September.....		79,973	79,973	178,701
October.....		204,555	74,777	279,632
November.....		230,516	72,653	303,169
December.....	\$750	99,841	45,049	145,413

Leaving the subject of bullion product, the next important question is that of

Mining Dividends.

As it has an intimate connection, of course, with the bullion product, we give a comparative table, showing the dividends from mining companies called on the Stock Boards in this city.

COMPANIES.	1873.	1874.	1875.
Belcher.....	\$ 6,762,000	\$5,304,000	\$ 312,000
Black Bear.....	45,000	60,000	.....
Crown Point.....	5,100,000	3,400,000	200,000
Consolidated Virginia.....	2,592,000	12,960,000	.....
Consolidated Amador.....	60,000	.....	.....
Coderberg.....	24,000	.....	.....
Charlotte Mill.....	.....	61,000	.....
Eureka.....	300,000	.....	.....
Eureka Consolidated.....	200,000	125,000	39,000
Empire.....	.....	.....	60,000
Excelsior.....	.....	.....	12,000
Golden Chariot.....	85,000	.....	.....
Gila.....	.....	.....	50,000
Indian Queen.....	.....	.....	50,000
K. K. Consolidated.....	62,500	.....	.....
Jefferson.....	.....	.....	50,000
La Grange.....	12,500	.....	12,500
Lyon M. & M. Co.....	.....	.....	50,000
Leopard.....	.....	.....	50,000
Manhattan.....	.....	.....	100,000
Meadow Valley.....	180,000	.....	.....
Monitor Belmont.....	75,000	.....	.....
Minnesota.....	00,000	.....	.....
Northern Belle.....	.....	.....	350,000
Oneida.....	300,000	.....	45,000
Oreana.....	.....	.....	.....
Raymond & Ely.....	.....	264,000	453,600
Redington Quicksilver.....	.....	.....	30,000
Rye Patch.....	.....	.....	30,000
West Comstock.....	.....	.....	50,000
Totals.....	13,306,000	11,803,000	15,235,100

An increase is shown in the gross amount of dividends this year, although they have been paid by fewer mines. The magnificent dividends of the Consolidated Virginia mine, however, exceed any ever paid by any mining company in the United States, and probably in the world. In addition to the very heavy expenses of such a well equipped mine, and the serious drawback of the fire, the mine has paid \$12,960,000 in dividends, with the prospect of increasing the amount this year. More information concerning this mine is given further on in this article.

California.

This State shows a falling off in the bullion product for 1875, the deficiency being caused principally by the light rains of the winter and the consequent decreased water supply for hydraulic mining. The rainfall so far this winter has been good, and without doubt next year will again see an increase of bullion. Of quartz mines in this State but few have been productive. Those in Nevada county have probably done the best, but the results are not encouraging. The Idaho mine produced \$495,669 in 1875, and paid in dividends \$174,050, but the annual report (published in this journal recently), was not encouraging as to future prospects. The Empire, in the same locality, paid \$50,000 in dividends in 1875. The New York Hill mine is said to have plenty of rich ore, but as yet has not been put on a dividend paying basis. The Fryer process, of which so much is expected, will shortly be in active operation in Grass Valley, and many of the mines which are not profitably worked by present systems are expected to pay by the new process. If it succeeds there, many other districts in California will be revived which now labor under similar disadvantages.

Panamint district, from which so much was expected, did not come up to anticipations last year, although a large amount of money was invested there in building roads, putting up mills and other improvements. The deposits were not so large as at first supposed, and the ores of a lower grade. Many of the people have removed from there to Darwin, Inyo county, where considerable work is being done. The ores are of a smelting character, and if balt what is said is true, the district must be a rich one. Smelting furnaces have been erected and just now the camp is in a flourishing condition.

The mines of Amador county, especially her quartz mines, have been worked during the year with indifferent success, but the close sees improving tendencies in the Amador Co. and the Phoenix. The Oneida paid \$45,000 in dividends, but none since August last.

The Oroville Mercury says that within the past few years a number of quartz mills have been built in Butte county and quite a start made in this kind of mining. From the character of the quartz along the northeastern part of this county, there can be no doubt but what, in coming time, a large number of mills will be kept constantly running. The heavy rains which have fallen this winter will furnish an abundance of water to work the hydraulic claims.

In Tuolumne county, the Independent says, in speaking of its mines: The Confidence, after a suspension of over two years, has again started up with good paying ore. The Riverside, after paying all running expenses, erecting a good ten-stamp mill with other improvements, has come upon a streak of poor ore, and upon this basis the mine has shut down for the present. The Sonleby mine, under similar circumstances, closed down a number of years ago, started afresh and is now a good paying property. The Hunter mine, after paying handsomely and taking out big gold, suspended. A tunnel has recently been run, striking in under the old works at a depth of several hundred feet, and specimens we have seen are very rich in free gold. The Golden Gate company are erecting new machinery for saving sulphurets, which are found in great abundance in the mine, and will soon be in good working order and paying handsome dividends. The

Marks & Darrow, Lady Washington, Grizzly, Chapparral and many others we might name are undergoing the work of development with great encouragement for success. The Spring Gulch works quietly bring its amalgam to town without any fuss. The Nouparril, under the management of Superintendent Duprat, near Garrote, has just had a big clean-up, and other mines in that part of the country are looking well. Of other parts of the State the quartz mining interests present few new features worthy of note.

The gravel mining interests of the State are still as important as ever, and it is the opinion of many that we have only just commenced our hydraulic mining operations, so great is the extent of auriferous gravel in the State, water only being needed to develop the riches. Details of operations at the gravel mines are difficult of access, as the mines are generally owned by close corporations, which publish no statements, and only those interested in them are cognizant of the result of operations. This winter, with its abundant water supply, most of the mines are working profitably, and a long and prosperous season is expected.

Nevada.

The mining interests of the State of Nevada were never in a more flourishing condition than at present, with the noble Comstock porriagies accumulated wealth in the channels of trade. Of the district outside of the Comstock, however, little can be said in the way of improvement.

At White Pine, when the camp was just about abandoned, a strike was made in the Eberhardt and Aurora mines, belonging to an English company, which it is supposed will put the district on its feet again, as it gives assurance that the deposits in the hill are continuous, and will be found with depth. At Pioche, little encouragement has been met with, for although the Raymond & Ely has produced considerable ore, no new discoveries have been made. If they find it possible with present pumping appliances to prospect below the water belt, they may find something which will make a great difference in the future of the camp.

Eureka district, next to the Comstock, is the most productive in Nevada. It produced 11,212 tons of bullion, which may be rated at least at \$225 per ton, thus showing a yield of about \$2,524,700. This is exclusive of the refined bullion forwarded by the Richmond, an English corporation, and which aggregated a very considerable sum. The principal mines are the Eureka Consolidated, Richmond, K. K. Con., Atlas, Jackson and Adams' Hill. In the latter some very promising developments have been made on the 150 and 200-ft levels, which give every assurance of magnifying into a rich and extensive deposit. The Eureka is yielding a plentiful supply of ore, and producing bullion in large quantities.

The Gila district, which lies a short distance from Eureka, has two bullion producing mines within her boundaries—the Gila and Tybo Con. The former is giving a yield in five and a half months of \$284,292.41; the latter had only begun the crushing of its rock the last part of the year.

One of the most promising new mining districts is located at Belleville, Esmeralda county, embracing several mines, the most productive of which is the Northern Belle, that yielded \$851,000 in eleven months of the year, and disbursed \$350,000 in dividends.

The Bonanza.

The most important matter to the mining interest of the country which has occurred of late years has been the development of the immensely productive bonanza on the Comstock. The results of the work done there have been such as to astonish the world and turn the attention of thousands to mining matters who never before gave them a thought. The great disaster of the fire at Virginia was a terrible setback, but energy, perseverance and plenty of money soon repaired the damages. The fire that swept a road half a mile in width through the heart of the city, and laid in ruins the complete and costly mills and hoisting works of the Consolidated Virginia, California and Ophir mining companies, rendered it next to impossible to reach the underground regions of those mines for some weeks.

Everything is now in working order again, and the Consolidated Virginia did not even stop paying its regular dividends. The prospects at the present time are decidedly flattering. The California mill just completed and started into operation, gives at once a monthly addition of \$800,000 or more to the bullion product of the country. The ore yield of the Ophir will be resumed in a day or two under the most flattering auspices. The Consolidated Virginia is constantly increasing its immense yield, and the great C. & C. shaft is being hastened as fast as unlimited means will allow, to the point where it will form a most important outlet to the wilderness of rich ore now waiting in the depths of the great bonanza. The Imperial is showing well, and important developments are eagerly looked for in the cross-cutting just commenced at the lower level of the Yellow Jacket. The consolidation already agreed upon of all the small mines of Gold Hill, into three or four large and effective ones, is an important and influential move. Belcher is yielding well, and improving. Overman, Silver Hill, Globe Consolidated, and other mines are showing good and improved ore developments, and all along the line the outlook is highly encouraging and propitious.

Many mines are now beginning to yield ore that have never been productive, and companies that for a time have been delving in

barren rock are again finding ore. The Belcher company has been able to resume the payment of dividends; at no distant day the Ophir will pay dividends—indeed, but for the fire, would have already paid one or two dividends—and dividends may be expected from several other mines. In April the drift from the O. & C. shaft will tap the 1500-ft level of the bonanza mines. When this shall have been done the whole of the compartments of the Consolidated shaft and the whole power of the works can be devoted to the hoisting of ore from the two mines—Consolidated and California. The huge mill of the former company will be rebuilt, and a second large mill will be put up by the latter at the O. & C. shaft. Then indeed will the bonanza begin to bleed.

We are unable to give space to any detailed description of the bonanza mines, and content ourselves in giving a table published in the *Alta*, showing the production of some of the noted mines in the past year.

COMPANIES.	Monthly Production of the Following Mines for the Year 1875.											
	January.	February.	March.	April.	May.	June.	July.	August.	September.	October.	November.	December.
Belcher.....	407,701	260,628	208,003	213,645	230,157	230,481	230,481	224,000	112,634	107,142	445,221	*410,000
Crown Point.....	347,338	833,439	27,920	817,128	347,712	239,580	244,387	224,757	186,975	164,055	165,311	*200,000
Consolidated Virginia.....	1,001,400	1,200,000	1,708,600	1,699,000	1,823,806	1,600,600	1,600,600	1,600,600	1,813,300	1,813,300	513,300	1,000,000
Ophir.....	20,035	22,039	17,512	24,537	24,231	31,681	24,468	20,537	20,721	20,115	22,054	39,427
Eureka Co. (Eureka).....	119,161	114,694	133,983	139,193	190,000	241,000	193,000	137,000	109,452	103,386	100,832	107,838
Northern Belle (Esmeralda).....	.....	2,833	1,042	41,002	100,065	91,410	122,213	59,207	115,579	93,125	100,386	103,431
Raymond & Ely.....	118,835	73,923	98,859	77,832	127,006	121,868	127,000	215,413	209,418	300,442	78,423	.....
Total.....	2,622	29,947	20,877	8,723	34,188	98,443	83,263	62,537	69,267	74,083	84,757	132,000
												\$20,000,653.

The Consolidated Virginia.

The richest mine in the world, made a most magnificent showing last year. Throughout the year there has been no cessation in the payment of the regular monthly dividends, which for the last ten months have been at the rate of \$10 per share. In October last the very disastrous fire which destroyed so great a part of Virginia City, swept away fine and extensive hoisting works and buildings, together with a vast amount of supplies of various kinds, and the splendid 60-stamp Consolidated and California mills (the latter of which was about starting up) materially affecting the crushing facilities. The misfortune compelled the stoppage of nearly all underground work, and necessitated the cessation of bullion shipments until the hoisting works and other necessary buildings could be replaced. This has been done, and new works and buildings superior to those destroyed were erected in the short space of two months.

During the past year 169,307 tons of ore have been extracted from all the levels of the Consolidated Virginia mine, and 169,094 tons have been reduced, which yielded \$18,731,653 in bullion. There are now in the ore house and at the mills 2,988 tons, valued by assay at \$478,080. This ore has been taken from the 1200, 1300, 1400 and 1500-ft levels, including a small quantity which has been gathered in the explorations which had been made on the 1550-ft level.

The cost of the joint shaft has been so far \$436,183.13. After the connection with the C. & C. shaft has been made, the superintendent thinks the hoisting capacity will be 2,000 tons per day. The total receipts at the mine for the year were \$17,060,855.88, of which \$16,953,771.39 was from bullion. The dividends amounted to \$12,204,000 for the year.

A two story building, 100 by 50 feet, is in the process of erection, to be used for the assay and bullion department, and it is now about one-half completed. When finished there will be room and facilities for melting and assay-

ing \$5,000,000 of bullion per month. The present estimates of ore in sight give a value of \$300,000,000. The new mill, with a crushing capacity of 300 tons per day, will increase the amount of ore extracted and reduced nearly one-half, and will add over \$800,000 per month to the yield of the mine. This will give a total yield for each month of \$2,500,000, and will almost, if not quite, permit of doubling the usual dividends of \$10 per share.

Other States and Territories.

Arizona in its bullion yield does not make that exhibit which should really be expected from that Territory. Within her borders are some very rich mines, which will, as soon as the machinery can be obtained requisite for working them, produce bullion in such large quantities as will attract more than common attention.

In Idaho there was not much of encouragement last year. Some of the mines are rich, but mismanagement and consequent assessments have brought the properties there into bad odor.

The Colorado production has increased, and the reports from there continue as glowing as ever. The great want of the Territory is capital, of which it has as yet but little.

Utah, although it produced \$6,145,211, is not in a prosperous condition as to mining interests. The Emma mining accident did much to hinder capital coming to Utah, and it is just now in rather bad odor. The Utah *Mine* gives the mineral products for 1875 as follows: Base bullion, \$4,086,900; silver lead, \$532,000; copper, \$87,948; copper ore, \$14,200; silver bars, \$637,763; gold dust, \$35,800; ore on dumps, \$750,000; total, \$6,145,211.

Oregon is not considered much of a mining State, although there are several good paying claims there, but agriculture is ahead in that section.

Quicksilver and Coal.

The production of Pacific coast coals has been as follows: Bellingham bay, 10,440 tons; Coos bay, 29,078 tons; Seattle, 59,327 tons; Port Townsend, 37 tons; Mount Diablo, 142,808 tons; Rocky mountain, 53 tons; total, 538,785 tons.

Of quicksilver, the feature of the year has been the great production, double that of any year for the past few years, and the rapid decline in price, which has accompanied this production—opening at \$1.55, the first decline was to \$1.30, then to \$1, then to 90c, subsequently to 75c, 70c and 65c by the first of July. The market then took an upward turn, reaching 70c in July, declining to 62½¢@65c in August. It then took another upward turn, reaching 80c@85c by the close of September. In October it declined to 67½¢@70c; in November to 65c, and in December to 60c@62½¢. The increase of production this year has been great. The *Bulletin* gives the following as the production:

Products		
New Almaden, flasks	13,648	Brought forward..... 46,842
New Idria.....	8,500	Sunderland..... 1,500
Redington.....	5,080	Cleveland..... 714
Sulphur Bank.....	5,213	Buckeye..... 700
Guadalupe.....	3,415	Manhattan..... 437
Great Western.....	3,384	Great Eastern..... 413
St. John.....	2,100	Phoenix..... 300
Oceanic.....	2,000	Various..... 3,000
Carried over.....	46,842	Total..... 63,708

The New Almaden mine continues to be the chief source of supply, its product having been increased fifty per cent. during the past year.

Conclusion.

In conclusion we append a few remarks on mining stocks, which, whatever may be said to the contrary, exercise a very important influence on the mining interests. According to a compilation of the transactions at the San Francisco Stock Board, the business for the past year has been fully up to the average of the previous year, if we allow for the absence of sales in September, during which Board sales were suspended on account of the financial panic. The sales of the Board for the past four years compare as follows:

1872.....	\$189,900,000	1874.....	\$260,500,000
1873.....	146,400,000	1875.....	320,200,000

There were 180 stocks dealt in at the San Francisco Board last year, and the total sales foot up 8,287,000 shares.

We give on another page a table compiled by the *Stock Report*, showing the highest and lowest prices of mining stocks during the past twelve months, giving place only to those stocks which are in the list of the San Francisco stock and exchange board. The prices of mining stocks have now such an influence on the mining interests of the coast, that most people look to the lists as an indication of the state of mining affairs. Although this is by no means a just view to take of the matter, many suppose that the fluctuations of stocks indicate to some extent the varying bullion product of the mines. The fact is that a very large proportion of the mines called at the boards are those on the Comstock lode. About half a dozen California mines are called, but they have no prominence. The Idaho mines, what few there are, are under disgrace from repeated assessments, and transactions on them are comparatively small. The great bulk of business is in Comstock shares, which, however, by no means vary according to the merits of the mines.

As will be seen by even a casual glance at the tables, the transactions this year have been subject to violent fluctuations. By following the lines along from left to right, it will be noticed that a gradual decline has taken place from month to month, until the sudden break when the Bank of California failed and the panic came. Since then there has been no very great advance to speak of, and few of the stocks have regained their places as yet.

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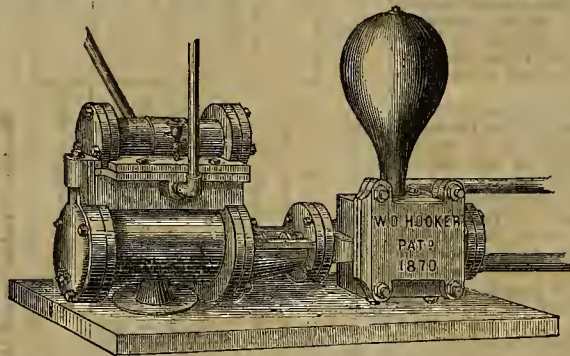
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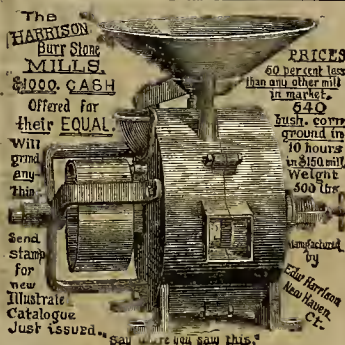
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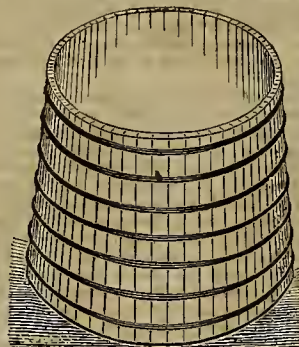
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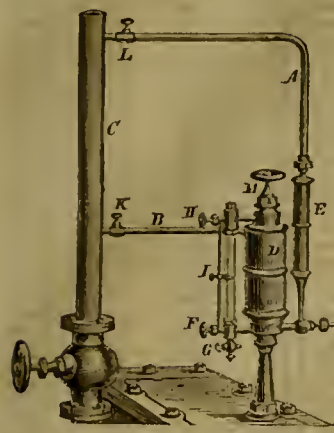
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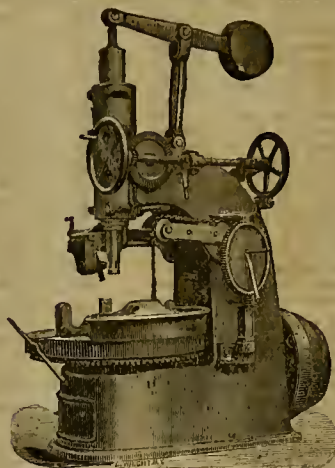
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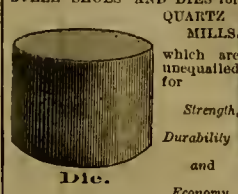
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FOR QUARTZ MILLS.

Made by our improved process. After many years of patient research and experiment we have succeeded in producing



QUARTZ MILLS.

which are unequalled for

Strength,

Durability

and

Economy.

Will wear three times longer than any iron Shoes.

BUILDERS AND CONTRACTORS

Of Quartz Mills, Pans, Separators, Concentrators, Jigs, Hydraulic Rock Breakers, Furnaces, Engines, Rollers and Shattering, and General Mining Machinery in all its details, and Furnishers of Mining Supplies. All orders promptly filled.

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Examination solicited.

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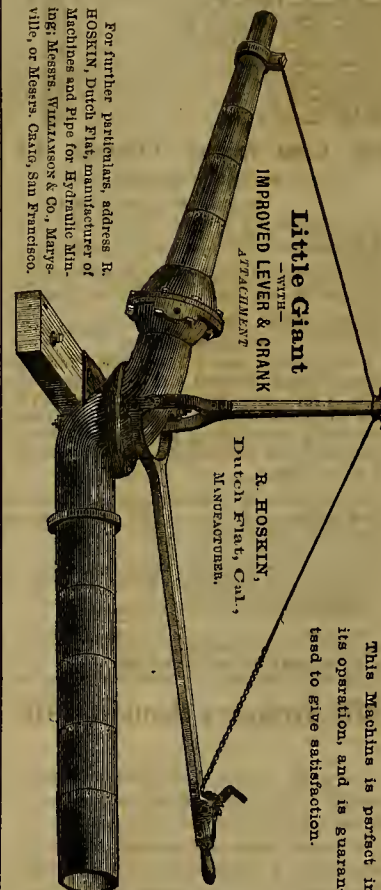


Manufacturers of ENGINE LATHES, 48 inches swing and smaller; VERTICAL BORING MACHINES, suitable for jobbing and boring Car Wheels; UPRIGHT DRILLS, 36 inches and smaller, and other Machinists' Tools.

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AND PENNSYLVANIA AVENUE,

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Little Giant

IMPROVED LEVER & CRANK ATTACHMENT

R. HOSKIN,
Dutch Flat, Cal.,
MANUFACTURER.

This Machine is perfect in its operation, and is guaranteed to give satisfaction.

NIMROD BAULSIR. RICHARD O. HANSON

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BLOCK & PUMP MAKERS,

IMPORTERS OF ALL KINDS OF

Patent Bushings & Gearing Apparatus,

STEEL FRICTION ROLLERS,

MINING BLOCKS OF ALL DESCRIPTIONS,

PRESSED LEATHER FOR PUMPS,

Lignum Vite for Mill Purposes.

NO. 9 SPEAR STREET,

Near Market, - - - - - San Francisco.

FERRACUTE PRESSES, DIES AND ALL FRUIT-CAN TOOLS
MACHINE WORKS BRIDGEPORT, N.J. SEND FOR LITHOGRAPH

METALS.

[WHOLESALE.]

WEDNESDAY M., January 19, 1876.

American Pig Iron, 30 ton	39 00	@	36 00
Scott Pig Iron, 30 ton	39 00	@	37 00
White Pig, 30 ton	39 00	@	38 00
Refined Bar, good assortment, 30 ton	39 00	@	40 00
Boiler, No. 1 to 4	39 00	@	41 00
Sheet, No. 5 to 8	39 00	@	42 00
Sheet, No. 10 to 14	39 00	@	43 00
Sheet, No. 16 to 20	39 00	@	44 00
Sheet, No. 22 to 24	39 00	@	45 00
Sheet, No. 26 to 28	39 00	@	46 00
Sheet, No. 30 to 32	39 00	@	47 00
Sheet, No. 34 to 36	39 00	@	48 00
Sheet, No. 38 to 40	39 00	@	49 00
Sheet, No. 42 to 44	39 00	@	50 00
Sheet, No. 46 to 48	39 00	@	51 00
Sheet, No. 50 to 52	39 00	@	52 00
Sheet, No. 54 to 56	39 00	@	53 00
Sheet, No. 58 to 60	39 00	@	54 00
Sheet, No. 62 to 64	39 00	@	55 00
Sheet, No. 66 to 68	39 00	@	56 00
Sheet, No. 70 to 72	39 00	@	57 00
Sheet, No. 74 to 76	39 00	@	58 00
Sheet, No. 78 to 80	39 00	@	59 00
Sheet, No. 82 to 84	39 00	@	60 00
Sheet, No. 86 to 88	39 00	@	61 00
Sheet, No. 90 to 92	39 00	@	62 00
Sheet, No. 94 to 96	39 00	@	63 00
Sheet, No. 98 to 100	39 00	@	64 00
Sheet, No. 102 to 104	39 00	@	65 00
Sheet, No. 106 to 108	39 00	@	66 00
Sheet, No. 110 to 112	39 00	@	67 00
Sheet, No. 114 to 116	39 00	@	68 00
Sheet, No. 118 to 120	39 00	@	69 00
Sheet, No. 122 to 124	39 00	@	70 00
Sheet, No. 126 to 128	39 00	@	71 00
Sheet, No. 130 to 132	39 00	@	72 00
Sheet, No. 134 to 136	39 00	@	73 00
Sheet, No. 138 to 140	39 00	@	74 00
Sheet, No. 142 to 144	39 00	@	75 00
Sheet, No. 146 to 148	39 00	@	76 00
Sheet, No. 150 to 152	39 00	@	77 00
Sheet, No. 154 to 156	39 00	@	78 00
Sheet, No. 158 to 160	39 00	@	79 00
Sheet, No. 162 to 164	39 00	@	80 00
Sheet, No. 166 to 168	39 00	@	81 00
Sheet, No. 170 to 172	39 00	@	82 00
Sheet, No. 174 to 176	39 00	@	83 00
Sheet, No. 178 to 180	39 00	@	84 00
Sheet, No. 182 to 184	39 00	@	85 00
Sheet, No. 186 to 188	39 00	@	86 00
Sheet, No. 190 to 192	39 00	@	87 00
Sheet, No. 194 to 196	39 00	@	88 00
Sheet, No. 198 to 200	39 00	@	89 00
Sheet, No. 202 to 204	39 00	@	90 00
Sheet, No. 206 to 208	39 00	@	91 00
Sheet, No. 210 to 212	39 00	@	92 00
Sheet, No. 214 to 216	39 00	@	93 00
Sheet, No. 218 to 220	39 00	@	94 00
Sheet, No. 222 to 224	39 00	@	95 00
Sheet, No. 226 to 228	39 00	@	96 00
Sheet, No. 230 to 232	39 00	@	97 00
Sheet, No. 234 to 236	39 00	@	98 00
Sheet, No. 238 to 240	39 00	@	99 00
Sheet, No. 242 to 244	39 00	@	100 00

LEATHER.

[WHOLESALE.]

WEDNESDAY M., January 19, 1876.

City Tanned Leather, 30 ton	22 25	@	22 25
Country Leather, 30 ton	22 25	@	22 25
Stockton Leather, 30 ton	22 25	@	22 25
Jodot, 8 Kil, per doz	50 00	@	50 00
Jodot, 10 Kil, per doz	50 00	@	50 00
Jodot, 12 Kil, per doz	50 00	@	50 00
Jodot, 14 Kil, per doz	50 00	@	50 00
Jodot, 16 Kil, per doz	50 00	@	50 00
Jodot, 18 Kil, per doz	50 00	@	50 00
Jodot, 20 Kil, per doz	50 00	@	50 00
Jodot, 22 Kil, per doz	50 00	@	50 00
Jodot, 24 Kil, per doz	50 00	@	50 00
Jodot, 26 Kil, per doz	50 00	@	50 00
Jodot, 28 Kil, per doz	50 00	@	50 00
Jodot, 30 Kil, per doz	50 00	@	50 00
Jodot, 32 Kil, per doz	50 00	@	50 00
Jodot, 34 Kil, per doz	50 00	@	50 00
Jodot, 36 Kil, per doz	50 00	@	50 00
Jodot, 38 Kil, per doz	50 00	@	50 00
Jodot, 40 Kil, per doz	50 00	@	50 00
Jodot, 42 Kil, per doz	50 00	@	50 00
Jodot, 44 Kil, per doz	50 00	@	50 00
Jodot, 46 Kil, per doz	50 00	@	50 00
Jodot, 48 Kil, per doz	50 00	@	50 00
Jodot, 50 Kil, per doz	50 00	@	50 00
Jodot, 52 Kil, per doz	50 00	@	50 00
Jodot, 54 Kil, per doz	50 00	@	50 00
Jodot, 56 Kil, per doz	50 00	@	50 00
Jodot, 58 Kil, per doz	50 00	@	50 00
Jodot, 60 Kil, per doz	50 00	@	50 00
Jodot, 62 Kil, per doz	50 00	@	50 00
Jodot, 64 Kil, per doz	50 00	@	50 00
Jodot, 66 Kil, per doz	50 00	@	50 00
Jodot, 68 Kil, per doz	50 00	@	50 00
Jodot, 70 Kil, per doz	50 00	@	50 00
Jodot, 72 Kil, per doz	50 00	@	50 00
Jodot, 74 Kil, per doz	50 00	@	50 00
Jodot, 76 Kil, per doz	50 00	@	50 00
Jodot, 78 Kil, per doz	50 00	@	50 00
Jodot, 80 Kil, per doz	50 00	@	50 00
Jodot, 82 Kil, per doz	50 00	@	50 00
Jodot, 84 Kil, per doz	50 00	@	50 00
Jodot, 86 Kil, per doz	50 00	@	50 00
Jodot, 88 Kil, per doz	50 00	@	50 00
Jodot, 90 Kil, per doz	50 00	@	50 00
Jodot, 92 Kil, per doz	50 00	@	50 00
Jodot, 94 Kil, per doz	50 00	@	50 00
Jodot, 96 Kil, per doz	50 00	@	50 00
Jodot, 98 Kil, per doz	50 00	@	50 00
Jodot, 100 Kil, per doz	50 00	@	50 00

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by CHARLES SUTTO & Co.]

SAN FRANCISCO, January 19, 3 P. M.

LEGAL TENDERS to S. F., 11 A. M., 85% to 93%.	
Gold in N. Y. 112 1/2.	
Gold Bars, 850 to 900. SILVER Bars, 7 1/2 and 8 per cent discount.	
EXCHANGE on N. Y., 60-100 per cent premium for gold; on London bankers, 4 1/2; Continental, 4 1/4; Paris, 4 1/2; France, 4 1/2; Mexico, 4 1/2; Mexican dollars, three to five per cent discount.	
LONDON - Consols, 93 to 93 1/2; Bonds, 102 1/2.	
Gold and Silver in S. F., by the bank, per lb, 72 1/2 to 75.	

A WORKMEN in one of the Eureka furnaces dumped a slag-pot filled with liquid fire into a bank of snow the other day, causing an explosion which was distinctly heard all over town, and totally demolishing the slag-pot, though fortunately not injuring the workman, except by a big scare.

It is reported that the bluffs at the Klamath Bluff mines caved in recently, killing three white men and two Chinamen.

Silence that terrible enemy of life, a had cough, with HALE'S HONEY OF HOREHOUND AND TAR, otherwise the cough may soon silence you.

Pike's Toothache Drops cure in one minute.

WOODWARD'S ORCHIDS enhances an Aquarium, Museum, Art Gallery, Conservatory, Tropical House, Menagerie, Seal Ponds and Skating Rink.

1876. Scribner's Monthly. 1876.

We invite the attention of the public to SCRIBNER'S MONTHLY, which now deservedly ranks among the BEST ILLUSTRATED MONTHLIES OF THE WORLD.

The papers illustrative of American scenery, which have appeared in its pages, among which were included "The Wonders of the Yellowstone" and the "Grand Canon of the Colorado," have won widespread admiration on both sides of the Atlantic; and "The Great South" articles, with their beautiful engravings, have been re-issued in book form in both Great Britain and America. For the coming year we have broader plans than ever before. The magazine will be enlarged, and there will be THREE REMARKABLE SERIAL STORIES BY AMERICAN WRITERS.

"Gabriel Onroy," by Bret Harte.

Of which the Boston Post says: "It is a serial that will make every new number of SCRIBNER'S eagerly sought for, if it had nothing else to recommend it."

The Canadian Illustrated News predicts that "we have found at last the American novel."

The Louisville Courier-Journal says: The second installment is even stronger than the first, justifying all that was looked for.

We begin in January.

"Philip Nolan's Friends,"

By EDWARD EVERETT HALE.

This is a historical romance. The scene is laid in the South-west, at a time when that territory was first Spanish, then French, and then American, and when war was imminent, to obtain control of the mouth of the Mississippi. It is likely to be the great romance of the Mississippi valley, as "Gabriel Onroy" will be of the Pacific slope.

"That Laes n' Lawrie's,"

By FANNY HODGSON BURNETT.

The friends of "SCRIBNER" who have read "Sully Tim's Trouble," "One Day at Arlo," "The Fire at Orantley Mills," and others of Mrs. Burnett's short stories, will not need to be assured that they have a rare treat before them. The scene of the new novel is laid in an English mining town, and from the first page to the last the interest is unflagging.

Among other notable papers we mention the following: A second "FARMER'S VACATION," by Col. GEORGE E. WARREN, descriptive of a row-boat ride of two hundred and fifty miles in one of the most fertile and interesting of the vine-growing valleys of Europe—a region never seen by the ordinary traveler, but full of interest, in its social and industrial aspects. A rare collection of REVOLUTIONARY LETTERS. A SERIES OF ILLUSTRATED ARTICLES ON AMERICAN COLLEGE. The series includes William and Mary, Harvard, Yale, Michigan State University, Wesleyan University, Amherst Agricultural College, Princeton, Union, Bowdoin, Trinity, and other typical institutions of the country. Elegantly illustrated articles on OLD NEW YORK, illustrated papers on AMERICAN CITIES, etc.

The editorial control and direction of the Magazine will remain in the hands of Dr. HOLLAND, who will contribute each month editorials upon current political and social topics. Our readers may look to "TOPICS OF THE TIME" for healthy opinion; "THE OLD CABINET" for pure sentiment; "HOME AND SOCIETY" for graceful economy; "CULTURE AND PROGRESS" for criticism; "THE WORLD'S WORK" for industrial intelligence; "BRIC-A-BRAC" for wit and innocent pleasantry.

SCRIBNER'S MONTHLY is now recognized, both in this country and in England, as the great representative American Magazine.

Encouraged by the favor accorded to it by a generous public, we shall aim, during the Centennial year, to eclipse its former achievements in both its literary and Art departments.

SCRIBNER is sold by all First-Class Booksellers and News-Dealers.

Price \$4.00 a Year; 35 cents a Number.

The 10 vols. complete, Nov. 1870, to Oct. 1875, bound in maroon cloth, \$30.00. Same bound in half morocco, 30.00. Vols. given in November and May. Any of the earlier volumes (I to VIII) will be supplied separately to parties who wish them to complete sets at this rate, i. e., cloth, \$2.00; half morocco, \$3.00.

Booksellers and Postmasters will be supplied at rates that will enable them to fill any of the above offers. Subscribers will please remit in P. O. money orders, or in bank checks or drafts, or by registered letters. Money in letters not registered at sender's risk.

November and December numbers FREE TO ALL NEW SUBSCRIBERS for 1876.

SCRIBNER & CO., 743 Broadway, N. Y.

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Cherokee Flat Blue Gravel Company—

Location of principal place of business, San Francisco, Cal. Location of works, Cherokee Flat, Butte County, Cal. Notice is hereby given, that at a meeting of the Board of Directors, held on the twenty-eighth day of December, 1875, an assessment, No. 35, of five cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin to the secretary, at the office of the company, room 13, Safe Deposit Building, No. 328 Montgomery street, San Francisco, Cal. Any stock upon which said assessment shall remain unpaid on the twenty-ninth day of January, 1876, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Saturday, the nineteenth day of February, 1876, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

C. H. BOGART, Secretary. Office, room 13, No. 328 Montgomery street, San Francisco, Cal.

Mariposa Land and Mining Company of California.

Location of works, Mariposa county, California. Notice.—There is delinquent upon the following described stock, on account of assessment (No. 3), levied on the 30th day of November, 1875, the several amounts set opposite the names of the respective shareholders, as follows:

COMMON STOCK.

Names.	No. Certificate.	No. Shares.	Amount.
Alexander, J. B.	unissued	100	\$100 00
Arnold, W. H.	423	25	25 00
Adams, Thomas.	428	55	55 00
Brumagin, J. H.	unissued	4200	4200 00

Names.	No. Certificate.	No. Shares.	Amount.	Names.	No. Certificate.	No. Shares.	Amount.
Brumagin, J. H.	425	25	25 00	Rathborne, R. Wm.	174	100	100 00
Brumagin, J. H.	427	25	25 00	Rathborne, R. Wm.	175	100	100 00
Bennett, N. R.	unissued	100	100 00	Rathborne, R. Wm.	176	100	100 00
Brumagin, Mark.	433	1	1 00	Rathborne, R. Wm.	177	100	100 00
Bullock, A. George.	unissued	100	100 00	Rathborne, R. Wm.	178	100	100 00
Bond & Co.	unissued	800	800 00	Rathborne, R. Wm.	179	100	100 00
Briggs, E. M.	unissued	100	100 00	Rathborne, R. Wm.	180	100	100 00
Bogert, J. A. C.	unissued	100	100 00	Rathborne, R. Wm.	181	100	100 00
Badcock, D. J.	85	100	100 00	Rathborne, R. Wm.	182	100	100 00
Badcock, D. J.	86	100	100 00	Rathborne, R. Wm.	183	100	100 00
Cody, Edmund.	unissued	50	50 00	Rathborne, R. Wm.	184	100	100 00
Crawford, Oeo R.	unissued	100	100 00	Rathborne, R. Wm.	185	100	100 00
Coepe, J. L.	unissued	100	100 00	Rathborne, R. Wm.	186	100	100 00
Castellano, A. V. & Co.	60	100	100 00	Rathborne, R. Wm.	187	100	100 00
Castellano, A. V. & Co.	61	100	100 00	Rathborne, R. Wm.	188	100	100 00
Castellano, A. V. & Co.	62	100	100 00	Rathborne, R. Wm.	189	100	100 00
Castellano, A. V. & Co.	63	100	100 00	Rathborne, R. Wm.	190	100	100 00
Castellano, A. V. & Co.	64	100	100 00	Rathborne, R. Wm.	191	100	100 00
Castellano, A. V. & Co.	65	100	100 00	Rathborne, R. Wm.	192	100	100 00
Curles, W. B.	272	100	100 00	Rathborne, R. Wm.	193	100	100 00
Dunnell, T. L.	unissued	25	25 00	Rathborne, R. Wm.	194	100	100 00
Durbrow, Lamont.	unissued	200	200 00	Rathborne, R. Wm.	195	100	100 00
DeLavan, C. J.	273	100	100 00	Rathborne, R. Wm.	196	100	100 00
English, Wm.	unissued	50	50 00	Rathborne, R. Wm.	197	100	100 00
Elsten, W. A.	unissued	1350	1350 00	Rathborne, R. Wm.	198	100	100 00
Flanoran, H. H.	unissued	200	200 00	Rathborne, R. Wm.	199	100	100 00
Fries, Chas.	unissued	200	200 00	Rathborne, R. Wm.	200	100	100 00
Furness, J. W.	unissued	50	50 00	Rathborne, R. Wm.	201	100	100 00
Farahan, Oeo O.	unissued	100	100 00	Rathborne, R. Wm.	202	100	100 00
Ferguson, Yates.	33	100	100 00	Rathborne, R. Wm.	203	100	100 00
Fisk & Hatch.	91	100	100 00	Rathborne, R. Wm.	204	100	100 00
Frim, John F.	436	1	1 00	Rathborne, R. Wm.	211	100	100 00
Oavante, J. A.	44	100	100 00	Rathborne, R. Wm.	212	100	100 00
Olemdenning, Davis & Co.	45	100	100 00	Rathborne, R. Wm.	213	100	100 00
Olemdenning, Davis & Co.	46	100	100 00	Rathborne, R. Wm.	216	100	100 00
Olemdenning, Davis & Co.	47	100	100 00	Rathborne, R. Wm.	218	100	100 00
Olemdenning, Davis & Co.	48	100	100 00	Rathborne, R. Wm.	219	100	100 00
Olemdenning, Davis & Co.	49	100	100 00	Rathborne, R. Wm.	221	100	100 00
Olemdenning, Davis & Co.	50	100	100 00	Rathborne, R. Wm.	222	100	100 00
Olemdenning, Davis & Co.	51	100	100 00	Rathborne, R. Wm.	223	100	100 00
Olemdenning, Davis & Co.	52	100	100 00	Rathborne, R. Wm.	224	100	100 00
Olemdenning, Davis & Co.	53	100	100 00	Rathborne, R. Wm.	225	100	100 00
Olemdenning, Davis & Co.	54	100	100 00	Rathborne, R. Wm.	226	100	100 00
Olemdenning, Davis & Co.	55	100	100 00	Rathborne, R. Wm.	227	100	100 00
Olemdenning, Davis & Co.	56	100	100 00	Rathborne, R. Wm.	228	100	100 00
Olemdenning, Davis & Co.	57	100	100 00	Rathborne, R. Wm.	229	100	100 00
Olemdenning, Davis & Co.	58	100	100 00	Rathborne, R. Wm.	230	100	100 00
Olemdenning, Davis & Co.	59	100	100 00	Rathborne, R. Wm.	231	100	100 00
Olemdenning, Davis & Co.	60	100	100 00	Rathborne, R. Wm.	232	100	100 00
Olemdenning, Davis & Co.	61	100	100 00	Rathborne, R. Wm.	233	100	100 00
Olemdenning, Davis & Co.	62	100	100 00	Rathborne, R. Wm.	234	100	100 00
Olemdenning, Davis & Co.	63	100	100 00	Rathborne, R. Wm.	235	100	100 00
Olemdenning, Davis & Co.	64	100	100 00	Rathborne, R. Wm.	236	100	100 00
Olemdenning, Davis & Co.	65	100	100 00	Rathborne, R. Wm.	237	100	100 00
Olemdenning, Davis & Co.	66	100	100 00	Rathborne, R. Wm.	238	100	100 00
Olemdenning, Davis & Co.	67	100	100 00	Rathborne, R. Wm.	239	100	100 00
Olemdenning, Davis & Co.	68	100	100 00	Rathborne, R. Wm.	240	100	100 00
Olemdenning, Davis & Co.	69	100	100 00	Rathborne, R. Wm.	241	100	100 00
Olemdenning, Davis & Co.	70	100	100 00	Rathborne, R. Wm.	242	100	100 00
Olemdenning, Davis & Co.	71	100	100 00	Rathborne, R. Wm.	243	100	100 00
Olemdenning, Davis & Co.	72	100	100 00	Rathborne, R. Wm.	244	100	100 00
Olemdenning, Davis & Co.	73	100	100 00	Rathborne, R. Wm.	245	100	100 00
Olemdenning, Davis & Co.	74	100	100 00	Rathborne, R. Wm.	246	100	100 00
Olemdenning, Davis & Co.	75	100	100 00	Rathborne, R. Wm.	247	100	100 00
Olemdenning, Davis & Co.	76	100	100 00	Rathborne, R. Wm.	248	100	100 00
Olemdenning, Davis & Co.	77	100	100 00	Rathborne, R. Wm.	249	100	100 00
Olemdenning, Davis & Co.	78	100	100 00	Rathborne, R. Wm.	250	100	100 00
Olemdenning, Davis & Co.	79	100	100 00	Rathborne, R. Wm.	251	100	100 00
Olemdenning, Davis & Co.	80	100	100 00	Rathborne, R. Wm.	252	100	100 00
Olemdenning, Davis & Co.	81	100	100 00	Rathborne, R. Wm.	253	100	100 00
Olemdenning, Davis & Co.	82	100	100 00	Rathborne, R. Wm.	254	100	100 00
Olemdenning, Davis & Co.	83	100	100 00	Rathborne, R. Wm.	255	100	100 00
Olemdenning, Davis & Co.	84	100	100 00	Rathborne, R. Wm.	256	100	100 00
Olemdenning, Davis & Co.	85	100	100 00	Rathborne, R. Wm.	257	100	100 00
Olemdenning, Davis & Co.	86	100	100 00	Rathborne, R. Wm.	258	100	100 00
Olemdenning, Davis & Co.	87	100	100 00	Rathborne, R. Wm.	259	100	100 00
Olemdenning, Davis & Co.	88	100	100 00	Rathborne, R. Wm.	260	100	100 00
Olemdenning, Davis & Co.	89	100	100 00	Rathborne, R. Wm.	261	100	100 00
Olemdenning, Davis & Co.	90	100	100 00	Rathborne, R. Wm.	262	100	100 00
Olemdenning, Davis & Co.	91	100	100 00	Rathborne, R. Wm.	263	100	100 00
Olemdenning, Davis & Co.	92	100	100 00	Rathborne, R. Wm.	264	100	100 00
Olemdenning, Davis & Co.	93	100	100 00	Rathborne, R. Wm.	265	100	100 00
Olemdenning, Davis & Co.	94	100	100 00	Rathborne, R. Wm.	266	100	100 00
Olemdenning, Davis & Co.	95	100	100 00	Rathborne, R. Wm.	267	100	100 00
Olemdenning, Davis & Co.	96	100	100 00	Rathborne, R. Wm.	268	100	100 00
Olemdenning, Davis & Co.	97	100	100 00	Rathborne, R. Wm.	269	100	100 00
Olemdenning, Davis & Co.	98	100	100 00	Rathborne, R. Wm.	270	100	100 00
Olemdenning, Davis & Co.	99	100	100 00	Rathborne, R. Wm.	271	100	100 00
Olemdenning, Davis & Co.	100	100	100 00	Rathborne, R. Wm.	272	100	100 00
Olemdenning, Davis & Co.	101	100	100 00	Rathborne, R. Wm.	273	100	100 00
Olemdenning, Davis & Co.	102	100	100 00	Rathborne, R. Wm.	274	100	100 00
Olemdenning, Davis & Co.	103	100	100 00	Rathborne, R. Wm.	275	100	100 00
Olemdenning, Davis & Co.	104	100	100 00	Rathborne, R. Wm.	276	100	100 00
Olemdenning, Davis & Co.	105	100	100 00	Rathborne, R. Wm.	277	100	100 00
Olemdenning, Davis & Co.	106	100	100 00	Rathborne, R. Wm.	278	100	100 00
Olemdenning, Davis & Co.	107	100	100 00	Rathborne, R. Wm.	279	100	100 00
Olemdenning, Davis & Co.	108	100	100 00	Rathborne, R. Wm.	280	100	100 00
Olemdenning, Davis & Co.	109	100	100 00	Rathborne, R. Wm.	281	100	100 00
Olemdenning, Davis & Co.	110	100	100 00	Rathborne, R. Wm.	282	100	100 00
Olemdenning, Davis & Co.	111	100	100 00	Rathborne, R. Wm.	283	100	100 00
Olemdenning, Davis & Co.	112	100	100 00	Rathborne, R. Wm.	284	100	100 00
Olemdenning, Davis & Co.	113	100	100 00	Rathborne, R. Wm.	285	100	100 00
Olemdenning, Davis & Co.	114	100	100 00	Rathborne, R. Wm.	286	100	100 00
Olemdenning, Davis & Co.	115	100	100 00	Rathborne, R. Wm.	287	100	100 00
Olemdenning, Davis & Co.	116	100	100 00	Rathborne, R. Wm.	288	100	100 00
Olemdenning, Davis & Co.	117	100	100 00	Rathborne, R. Wm.	289	100	100 00
Olemdenning, Davis & Co.	118	100	100 00	Rathborne, R. Wm.	290	100	100 00
Olemdenning, Davis & Co.	119	100	100 00	Rathborne, R. Wm.	291	100	100 00
Olemdenning, Davis & Co.	120	100	100 00	Rathborne, R. Wm.	292	100	100 00
Olemdenning, Davis & Co.	121	100	100 00	Rathborne, R. Wm.	293	100	100 00
Olemdenning, Davis & Co.	122	100	100 00	Rathborne, R. Wm.	294	100	100 00
Olemdenning, Davis & Co.	123	100	100 00	Rathborne, R. Wm.	295	100	100 00
Olemdenning, Davis & Co.	124	100	100 00	Rathborne, R. Wm.	296	100	100 00
Olemdenning, Davis & Co.	125	100	100 00	Rathborne, R. Wm.	297	100	100 00
Olemdenning, Davis & Co.	126	100	100 00	Rathborne, R. Wm.	298	100	100 00
Olemdenning, Davis & Co.	127	100	100 00	Rathborne, R. Wm.	299	100	100 00
Olemdenning, Davis & Co.	128	100	100 00	Rathborne, R. Wm.	300	100	100 00
Olemdenning, Davis & Co.	129	100	100 00	Rathborne, R. Wm.	301	100	100 00
Olemdenning, Davis & Co.	130	100	100 00	Rathborne, R. Wm.	302	100	100 00
Olemdenning, Davis & Co.	131	100	100 00	Rathborne, R. Wm.	303	100	100 00
Olemdenning, Davis & Co.	132	100	100 00	Rathborne, R. Wm.	304	100	100 00
Olemdenning, Davis & Co.	133	100	100 00	Rathborne, R. Wm.	305	100	100 00
Olemdenning, Davis & Co.	134	100	100 00	Rathborne, R. Wm.	306	100	100 00
Olemdenning, Davis & Co.	135	100	100 00	Rathborne, R. Wm.	307	100	100 00
Olemdenning, Davis & Co.	136	100	100 00	Rathborne, R. Wm.	308	100	100 00
Olemdenning, Davis & Co.	137	100	100 00	Rathborne, R. Wm.	309	100	100 00
Olemdenning, Davis & Co.	138	100	100 00	Rathborne, R. Wm.	310	100	100 00
Olemdenning, Davis & Co.	139	100	100 00	Rathborne, R. Wm.	311	100	100 00
Olemdenning, Davis & Co.	140	100	100 00	Rathborne, R. Wm.	312	100	100 00
Olemdenning, Davis & Co.	141	100	100 00	Rathborne, R. Wm.	313	100	100 00
Olemdenning, Davis & Co.	142	100	100 00	Rathborne, R. Wm.	314	100	100 00
Olemdenning, Davis & Co.	143	100	100 00	Rathborne, R. Wm.	315	100	100 00
Olemdenning, Davis & Co.	144	100	100 00	Rathborne, R. Wm.	316	100	100 00
Olemdenning, Davis & Co.	145	100	100 00	Rathborne, R. Wm.	317	100	100 00
Olemdenning, Davis & Co.	146	100	100 00	Rathborne, R. Wm.	318	100	100 00
Olemdenning, Davis & Co.	147	100	100 00	Rathborne, R. Wm.	319	100	100 00
Olemdenning, Davis & Co.	148	100	100 00	Rathborne, R. Wm.	320	100	100 00
Olemdenning, Davis & Co.	149	100	100 00	Rathborne, R. Wm.	321	100	100 00
Olemdenning, Davis & Co.	150	100	100 00	Rathborne, R. Wm.	322	100	100 00
Olemdenning, Davis & Co.	151	100	100 00	Rathborne, R. Wm.	323	100	100 00
Olemdenning, Davis & Co.	152	100	100 00	Rathborne, R. Wm.	324	100	100 00
Olemdenning, Davis & Co.	153	100	100 00	Rathborne, R. Wm.	325	100	100 00
Olemdenning, Davis & Co.	154	100	100 00	Rathborne, R. Wm.	326	100	100 00
Olemdenning, Davis & Co.	155	100	100 00	Rathborne, R. Wm.	327	100	100 00
Olemdenning, Davis & Co.	156	100	100 00	Rathborne, R. Wm.	328	100	100 00
Olemdenning, Davis & Co.	157	100	100 00	Rathborne, R. Wm.	329	100	100 00
Olemdenning, Davis & Co.	158	100	100 00	Rathborne, R. Wm.	330	100	100 00
Olemdenning, Davis & Co.	159	100	10				

Names.	No. Certificate.	No. Shares.	Amount.
B H Lange, trustee.....	60	13000	3600 00
O H Lagrange, trustee.....	39	1000	30 00
T H Marjane.....	21	1000	300 00
J W Pence, John Watson and R B Langdon, one undivided third each.....	36	100	30 00
J W Pence, John Watson and R B Langdon, one undivided third each.....	40	19900	6970 00
J W Pence, John Watson and R B Langdon, one undivided third each.....	42	2500	750 00
H H Pearson.....	44	100	30 00

And in accordance with law, and an order of the Board of Supervisors of the first day of November, 1875, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, on the fifteenth day of January, 1876, at the hour of 2 o'clock, p. m., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

JOHN E. McDONALD, Secretary.
Office, No. 405 California street, San Francisco, Cal.

Pauper Mining Company.—Location of

principal place of business, San Francisco, California.
Location of works, Owyhee county, Idaho Territory.

Notice.—There are delinquent upon the following described stock, on account of Assessment No. 6, levied on the 9th day of November, 1875, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Certificate.	No. Shares.	Am't.
W F Bogart, Trustee.....	2	100	\$20 00
W F Bogart, Trustee.....	7	150	30 00
W F Bogart, Trustee.....	8	150	30 00
W F Bogart, Trustee.....	9	100	20 00
W F Bogart, Trustee.....	10	100	20 00
Crocker & Gunnett, Trustees.....	11	25	5 00
Crocker & Gunnett, Trustees.....	12	25	5 00
Crocker & Gunnett, Trustees.....	13	25	5 00
G A Couden, Trustee.....	14	500	100 00
G A Couden, Trustee.....	15	100	20 00
G A Couden, Trustee.....	16	100	20 00
G A Couden, Trustee.....	17	100	20 00
G A Couden, Trustee.....	18	100	20 00
G A Couden, Trustee.....	19	100	20 00
G A Couden, Trustee.....	20	100	20 00
O P Gordon, Trustee.....	35	100	20 00
James Lincoln, Trustee.....	55	80	10 00
W F Bogart, Trustee.....	56	150	30 00
W F Bogart, Trustee.....	63	100	20 00
W F Bogart, Trustee.....	64	100	20 00
W F Bogart, Trustee.....	65	300	50 00
W F Bogart, Trustee.....	66	750	150 00
W F Bogart, Trustee.....	67	160	30 00
W F Bogart, Trustee.....	58	140	30 00
W F Bogart, Trustee.....	59	100	20 00
W F Bogart, Trustee.....	70	225	45 00
W F Bogart, Trustee.....	71	75	15 00
W F Bogart, Trustee.....	80	25	5 00
W F Bogart, Trustee.....	81	25	5 00
W F Bogart, Trustee.....	82	25	5 00
W F Bogart, Trustee.....	87	50	10 00
W F Bogart, Trustee.....	88	80	10 00
W F Bogart, Trustee.....	89	10	2 00
G H Bogart, Trustee.....	90	300	60 00
C H Bogart, Trustee.....	91	1000	2 00
C H Bogart, Trustee.....	92	1000	200 00
C H Bogart, Trustee.....	93	1000	200 00
C H Bogart, Trustee.....	94	300	60 00
C H Bogart, Trustee.....	95	5	1 00
C H Bogart, Trustee.....	96	5	1 00
D L McDonald.....	98	5	1 00
A P Minear.....	99	5	1 00
Cope, Uhler & Co, Trustees.....	101	25	5 00
Cope, Uhler & Co, Trustees.....	102	500	100 00
Cope, Uhler & Co, Trustees.....	103	500	100 00
Cope, Uhler & Co, Trustees.....	104	500	100 00
Cope, Uhler & Co, Trustees.....	105	100	20 00
Cope, Uhler & Co, Trustees.....	106	100	20 00
Cope, Uhler & Co, Trustees.....	108	100	20 00
J H H Williams.....	110	30	5 00
D Wilder.....	111	30	6 00
J N Hill, Trustee.....	110	100	20 00
Parker & Fry, Trustees.....	124	50	10 00
Parker & Fry, Trustees.....	125	50	10 00
Parker & Fry, Trustees.....	126	50	10 00
Parker & Fry, Trustees.....	127	50	10 00
G H Purdy, Trustee.....	135	100	20 00
G H Purdy, Trustee.....	137	50	10 00
W B Howell, Trustee.....	140	75	15 00
C E Eckerd, Trustee.....	141	150	30 00
N O Efford, Trustee.....	149	25	5 00
N O Efford, Trustee.....	150	25	5 00
C E Eckerd, Trustee.....	151	25	5 00
W F Bogart, Trustee.....	155	100	20 00
W F Bogart, Trustee.....	156	50	10 00
W F Bogart, Trustee.....	159	100	20 00
W F Bogart, Trustee.....	160	50	10 00
Saml Marks, Trustee.....	167	80	5 00
Saml Marks, Trustee.....	158	30	6 00
W F Bogart, Trustee.....	169	100	20 00
W F Bogart, Trustee.....	173	50	10 00
W F Bogart, Trustee.....	174	50	10 00
W F Bogart, Trustee.....	177	100	20 00
H H Noble & Co, Trustees.....	180	50	10 00
H H Noble & Co, Trustees.....	181	50	10 00
H H Noble & Co, Trustees.....	182	50	10 00
H H Noble & Co, Trustees.....	183	50	10 00
H H Noble & Co, Trustees.....	184	50	10 00
H H Noble & Co, Trustees.....	185	50	10 00
H H Noble & Co, Trustees.....	186	100	20

Names.	No. Certificate.	Nb. Shares.	Am't.
M Moritz, Trustee.....	286	25	5 00
M Gordon, Trustee.....	290	50	10 00
M Moritz, Trustee.....	291	50	10 00
C P Gordon, Trustee.....	292	25	5 00
C P Gordon, Trustee.....	293	50	10 00
Hill & Kilgour, Trustees.....	294	25	5 00
Wm Maxford, Trustee.....	297	60	12 00
Wm Maxford, Trustee.....	298	60	12 00
M Moritz, Trustee.....	299	50	10 00
M Moritz, Trustee.....	300	50	10 00
M Moritz, Trustee.....	302	100	20 00
C A Schmitt, Trustee.....	303	50	10 00
C A Schmitt, Trustee.....	304	50	10 00
J D Parker, Trustee.....	305	100	20 00
J D Parker, Trustee.....	306	100	20 00
W F Bogart, Trustee.....	307	200	40 00
J E Purdy, Trustee.....	308	50	10 00
J E Purdy, Trustee.....	309	25	5 00
W F Bogart, Trustee.....	310	100	20 00
W F Bogart, Trustee.....	311	100	20 00
W F Bogart, Trustee.....	312	100	20 00
W F Bogart, Trustee.....	313	50	10 00
W F Bogart, Trustee.....	314	40	8 00
W F Bogart, Trustee.....	315	50	10 00
W S Lycas, Trustee.....	317	20	4 00
W F Bogart, Trustee.....	318	150	30 00
Ernest Anselia, Trustee.....	322	150	30 00
W Turnbull & Co, Trustees.....	325	75	15 00
W Turnbull & Co, Trustees.....	328	25	5 00
Hale, Page & Wilson, Trustees.....	327	150	30 00
C P Gordon, Trustee.....	328	100	20 00
W F Bogart, Trustee.....	330	100	20 00
W F Bogart, Trustee.....	331	100	20 00
W F Bogart, Trustee.....	334	100	20 00
W F Bogart, Trustee.....	335	100	20 00
Chas Athearn, Trustee.....	338	100	20 00
Chas Athearn, Trustee.....	337	100	20 00
Chas Athearn, Trustee.....	338	100	20 00
S E Holcombe, Trustee.....	339	100	20 00
S E Holcombe, Trustee.....	340	100	20 00
S E Holcombe, Trustee.....	341	100	20 00
S E Holcombe, Trustee.....	342	30	6 00
Riotte & Beyer, Trustees.....	343	100	20 00
Riotte & Beyer, Trustees.....	344	100	20 00
Riotte & Beyer, Trustees.....	345	100	20 00
Riotte & Beyer, Trustees.....	346	100	20 00
Riotte & Beyer, Trustees.....	347	100	20 00
Riotte & Beyer, Trustees.....	348	100	20 00
M Moritz, Trustee.....	349	20	4 00
M Moritz, Trustee.....	350	20	4 00
M Moritz, Trustee.....	351	20	4 00
M Moritz, Trustee.....	352	20	4 00
M Moritz, Trustee.....	353	20	4 00
M Moritz, Trustee.....	354	20	4 00
M Moritz, Trustee.....	355	20	4 00
M Moritz, Trustee.....	356	20	4 00
M Moritz, Trustee.....	357	20	4 00
M Moritz, Trustee.....	358	20	4 00
M Moritz, Trustee.....	359	50	10 00
M Moritz, Trustee.....	360	50	10 00
M Moritz, Trustee.....	361	50	10 00
M Moritz, Trustee.....	362	50	10 00
M Moritz, Trustee.....	363	50	10 00
M Moritz, Trustee.....	364	50	10 00
M Moritz, Trustee.....	365	100	20 00
M Moritz, Trustee.....	366	100	20 00
M Moritz, Trustee.....	367	100	20 00
M Moritz, Trustee.....	368	100	20 00
Joseph Jock, Trustee.....	369	100	20 00
Joseph Jock, Trustee.....	370	100	20 00
W H Richards, Trustee.....	371	10	2 00
W H Richards, Trustee.....	372	50	10 00
L F Loveland, Trustee.....	373	105	21 00
A H Webb, Trustee.....	374	50	10 00
A H Webb, Trustee.....	375	100	20 00
A H Webb, Trustee.....	376	100	20 00
A H Webb, Trustee.....	377	100	20 00
A H Webb, Trustee.....	378	100	20 00
W F Bogart, Trustee.....	379	100	20 00
W F Bogart, Trustee.....	380	100	20 00
W F Bogart, Trustee.....	381	100	20 00
G W Stanley, Trustee.....	388	100	20 00
J L Barstow, Trustee.....	389	100	20 00
J L Barstow, Trustee.....	390	100	20 00
J L Barstow, Trustee.....	391	100	20 00
J L Barstow, Trustee.....	392	100	20 00
J L Barstow, Trustee.....	393	100	20 00
J L Barstow, Trustee.....	394	100	20 00
H H Noble & Co, Trustee.....	396	50	10 00
H H Noble & Co, Trustee.....	397	50	10 00
W F Bogart, Trustee.....	398	100	20 00
W F Bogart, Trustee.....	399	100	20 00
W F Bogart, Trustee.....	400	100	20 00
Geo R Wells, Trustee.....	401	100	20 00
Geo R Wells, Trustee.....	402	100	20 00

Iron and Machine Works.

THE RISDON

Iron and Locomotive Works,

INCORPORATED.....APRIL 30, 1868.
CAPITAL.....\$1,000,000.

LOCATION OF WORKS:

Corner of Beale and Howard Streets,
SAN FRANCISCO.

Manufacturers of Steam Engines, Quartz and Flour Mill Machinery, Steam Boilers (Marine, Locomotive and Stationary), Marine Engines (High and Low Pressure). All kinds of light and heavy Castings at lowest prices. Cams and Tappets, with chilled faces, guaranteed 40 per cent. more durable than ordinary iron.

Directors:

Joseph Moore, Jesse Holladay, C. E. McLane,
Wm. Norris, Wm. H. Taylor, J. B. Haggis,
James D. Walker.

WM. H. TAYLOR.....President
JOSEPH MOORE.....Vice-President and Superintendent
LEWIS R. MEAD.....Secretary
24v17-47

WM. HAWKINS.

T. G. CANTRELL

HAWKINS & CANTRELL,

MACHINE WORKS,

210 & 212 Beale St.,

Near Howard. - - - SAN FRANCISCO.

MANUFACTURERS OF

Steam Engines and all kinds of Mill and Mining Machinery.

Also manufacture and keep constantly on hand a supply of our

Improved Portable Hoisting Engines,

From Ten (10) to Forty (40) Horse Power.

N. B.—Jobbing and Repairing done with Dispatch.

FULTON

Foundry and Iron Works.

HINCKLEY & CO.,

MANUFACTURERS OF

STEAM ENGINES,

Quartz, Flour and Saw Mills.
Hayes' Improved Steam Pump, Brodie's Improved Crusher, Mining Pumps, Amalgamators, and all kinds of Machinery.

N. E. corner of Tehama and Fremont streets, above Howard street, San Francisco. 3-47

UNION IRON WORKS,
Sacramento.

ROOT, NEILSON & CO.,

MANUFACTURERS OF

STEAM ENGINES, BOILERS,
CROSS' PATENT BOILER FEEDER AND SEDIMENT COLLECTOR

Dunbar's Patent Self-Adjusting Steam Piston Packing, for new and old Cylinders.

And all kinds of Mining Machinery.

Front Street, between N and O streets,
SACRAMENTO CITY.

Empire Foundry,

Nos. 137, 139 and 141 FREMONT STREET, SAN FRANCISCO.

RICHARD SAVAGE, Proprietor.

Heavy and Light Castings of every description. House Fronts, Mining and General Machinery estimated and constructed at shortest notice. On hand the celebrated Occident and French Ranges, Burial Caskets, Grates and Fenders, Road Scrapers, Hydrants, Turners' Irons, Ploughwork, Sash Weights, Ventilators, Dumb Bells, Gipsies, Ship Castings, SOLE PIPE of all sizes, Fittings and Cauldron Kettles in stock at Eastern rates. SHOES and DIES a specialty. Ornamental Fences in large variety. 4v30-17r.

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MANUFACTURERS

OF ALL KINDS OF CAR WORK,

Machine Bolts, Bridge Bolts and Ship or Band Bolts.

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CALIFORNIA BRASS FOUNDRY,
No. 125 First street, opposite Minna,
SAN FRANCISCO.

ALL KINDS OF Brass, Composition, Zinc, and Babbitt Metal Castings, Brass Ship Work of all kinds, Spikes, Sheath Nails, Rudder Braces, Hinges, Ship and Steamboat Bolts and Gongs of superior tone. All kinds of Cocks and Valves, Hydraulic Pipes and Nozzles, and Hose Couplings and Connections of all sizes and patterns, furnished with dispatch at PRICES MODERATE. J. H. WOOD, Y. KINGWELL.

IRON PIPE

FOR STEAM, GAS AND WATER.

Boiler Tubes

-AND-

LAP-WELDED PUMP COLUMN

FOR SALE BY

DUNHAM, CARRICAN & CO.,

DEALERS IN

HARDWARE, IRON,

Black Diamond Steel,

Etc., Etc.,

107, 109 and 111 FRONT STREET,

108, 110 and 112 PINE STREET, San Francisco.

GIANT POWDER.

Patented May 26, 1868.

THE ONLY SAFE BLASTING POWDER IN USE.

GIANT POWDER, NO. 1,

For hard and wet Rock, Iron, Copper, etc., and Submarine Blasting.

GIANT POWDER, NO. 2,

For medium and sandy Rock, Lime, Marble, Sulphur, Coal, Pipe Clay and Gravel Bank Blasting, Wood, etc.

Its EXCLUSIVE use saves from 30 to 60 per cent. in expenses, besides doing the work in half the time required for black powder.

The only Blasting Powder used in Europe and the Eastern States.

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General Agents, No. 210 Front Street.

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Rolling Mill Company.

SAN FRANCISCO, CAL.

Established for the Manufacture of

RAILROAD AND OTHER IRON
-AND-
Every Variety of Shafting.

Embracing ALL SIZES of

Steamboat Shafts, Cranks, Piston and Connecting Rods, Car and Locomotive Axles and Frames,

-ALSO-

HAMMERED IRON

Of every description and size.

Orders addressed to PACIFIC ROLLING MILL COMPANY, P. O. box 2032, San Francisco, Cal., will receive prompt attention.

The highest price paid for Scrap Iron.

SHEET IRON PIPE.

THE

Risdon Iron and Locomotive Works

Corner Howard and Beale Streets,

Are prepared to make SHEET IRON AND ASPHALTUM PIPE, of any size and for any pressure, and contract to lay the same where wanted, guaranteeing a perfect working pipe with the least amount of material.

Standard sizes of railroad Car Wheels, with special patterns for Mining Cars. These small wheels are made of the best Car Wheel Iron, properly chilled, and can be fitted up with the improved axle and box—introduced by this company, and guaranteed to outlast any other wheels made in this State.

All kinds of Machinery made and repaired.

24v22-3m JOSEPH MOORE, Superintendent.

Brass Foundry & Pump Factory.

A. J. SMITH, Plumber,

Sole Proprietor and Manufacturer of the Celebrated Hudson Force Pumps, Atwood & Bodwell Windmill Brass Pumps, Smith's Copper-Lined Pumps, Plumbers' Force Pumps.

Special attention paid to Brewers', Distillers', Beer and Hot Liquor Pumps and Wine Pumps. Particular attention paid to AIR PUMPS, also to

DIVERS' SUBMARINE PUMPS.

Artesian Well Pumps Made to Order.

Brass Castings Made to Order.
No. 222 FREMONT STREET, - - SAN FRANCISCO

THOS. PENDERGAST.

HENRY S. SMITH.

ÆTNA IRON WORKS.

MANUFACTURERS OF

IRON CASTINGS

and MACHINERY,

OF ALL KINDS.

Fremont Street, bet. Howard and Folsom.

SAN FRANCISCO.

California Machine Works,

119 BEALE STREET, SAN FRANCISCO.

BIRCH, ARGALL & CO.,

Builders of QUARTZ, SAW AND FLOUR MILLS

Keating's Sack Printing Presses,

THE ECONOMY HYDRAULIC HOIST for Stones,
And General Machinists. 25v28-3m

Miners' Foundry and Machine Works,

CO-OPERATIVE,

First Street, bet. Howard and Folsom, San Francisco.

Machinery and Castings of all kinds.

McAFEE, SPIERS & CO.,

BOILER MAKERS

AND GENERAL MACHINISTS,

Howard st., between Fremont and Beale, San Francisco

STEAM ENGINES AND BOILERS

Of all sizes—from 2 to 60-Horse power. Also, Quartz Mills, Mining Pumps, Hoisting Machinery, Shafting, Iron Tanks, etc. For sale at the lowest prices by

10v27tf

J. HENDY, No. 32 Fremont Street.

IRA P. RANKIN. Established 1850. A. P. BRAYTON

Pacific Iron Works,

FIRST STREET, - - - SAN FRANCISCO.

Geo. W. Fogg, Supt.

MACHINERY AND CASTINGS

OF EVERY DESCRIPTION.

Heavy Forging Boilers, Stationary and Marine.

JOBBER AND REPAIRING WORK OF EVERY KIND. SPECIAL ATTENTION GIVEN TO MINING AND HOISTING MACHINERY.

Sole Manufacturers and Agents of

PRALL'S PATENT STEAM PUMP.

GODDARD & CO., Proprietors.

THOMPSON BROTHERS,

EUREKA FOUNDRY,

129 and 131 Beale street, between Mission and Howard, San Francisco.

LIGHT AND HEAVY CASTINGS,

of every description, manufactured 24v16q

At a Stated Term of the Circuit Court of the United States of America of the Ninth Judicial Circuit in and for the District of California, held at the court room in the city and county of San Francisco, on Thursday, the 30th day of September, in the year of our Lord one thousand eight hundred and seventy-five. Present—The Honorable Lorenzo Sawyer, Judge.

Nicholas Seibert, complainant, vs. Wm. T. Garratt, defendant—In equity.

DECREES.

This cause came in to be heard at the February Term, A. D. 1875, of this Court and was argued by counsel and thereupon upon consideration thereof, it was ordered, adjudged and decreed, as follows, viz: That defendant, William T. Garratt, was not the first or original inventor, or discoverer of the improvement or discovery claimed by him, in and by those certain reissued letters patent of the United States, number five thousand three hundred and twenty-eight (No. 5328), for an alleged new and useful improvement in lubricators, issued to said defendant, William T. Garratt, on the 18th day of March, A. D. 1873, and is not entitled to a patent therefor, and that said reissued letters patent, number five thousand three hundred and twenty-eight (No. 5328) are declared void and the same are hereby vacated and set aside by reason of their interference with those certain letters patent of the United States, number one hundred and eleven thousand eight hundred and eighty-one (No. 111,881) for a new and useful improvement in lubricators, issued to complainant, Nicholas Seibert, on the fourteenth (14th) day of February, A. D. 1871.

It was also further ordered, adjudged and decreed that complainant do have and recover of and from defendant his costs and expenses to be taxed herein.

(Signed)

LORENZO SAWYER,

Circuit Judge.

The above decree has reference to "Seibert's Eureka Lubricator" for oiling the valves and cylinders of steam engines.

It has a glass gauge and condensing pipe, or reservoir, with a regulating feed valve, and works as follows: As the water of condensation is admitted, under the oil, just as fast as the oil passes out at the top through a pipe into the steam pipe to oil the valves and cylinder.

Parties who infringe or purchase the infringing lubricators, will be held strictly responsible.

N. SEIBERT, Patentee,

125 First Street, S. F.

FRANCIS SMITH & CO.,

MANUFACTURERS OF

Hydraulic Pipe,

AND

ARTESIAN WELL PIPE.

Having the Latest Improved Machinery, we can make it an object to

Mining & Water Companies

OR

WATER WORKS,

To Contract with us for

SHEET-IRON PIPE.

All Sizes Made and all Work Guaranteed

30 Beale Street,

BLACK DIAMOND FILE WORKS.



G. & H. BARNETT,
Manufacturers of Files of every Description

Nos. 39, 41 and 43 Richmond street,

Philadelphia, Pa.

Sold by all the principal hardware stores on the Pacific Coast.

18v25.1y

Glasgow Iron and Metal Importing Co.

Have always on hand a large Stock of

Bar and Bundle Iron, Sheet and Plate Iron, Boiler Flues, Gaseous Water Pipe, Cast Steel, Flows and Shear Steel, Anvils, Cumberland Coal, Etc.

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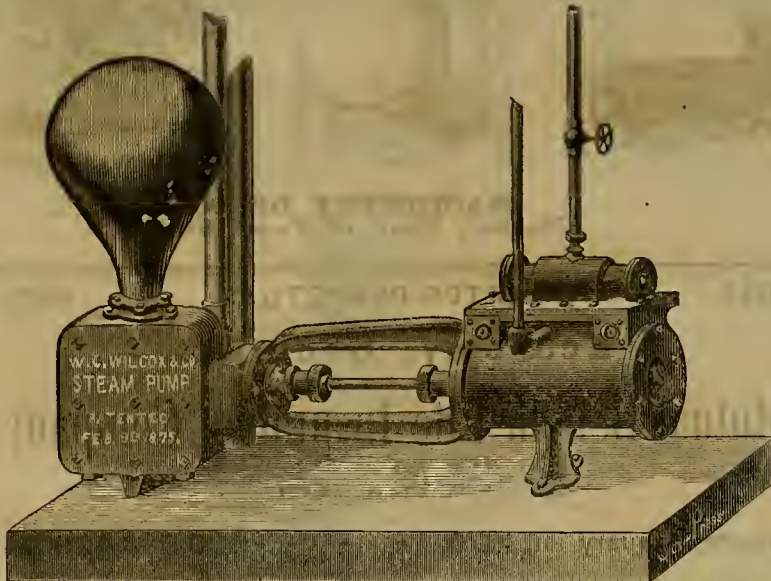
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Also to our Especial Construction of Pumps FOR HANDLING QUICKSILVER or heavy liquids.

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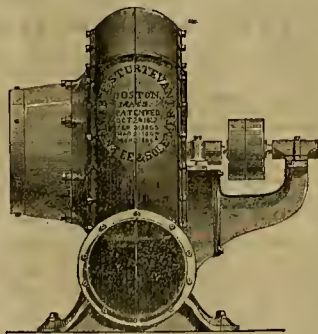
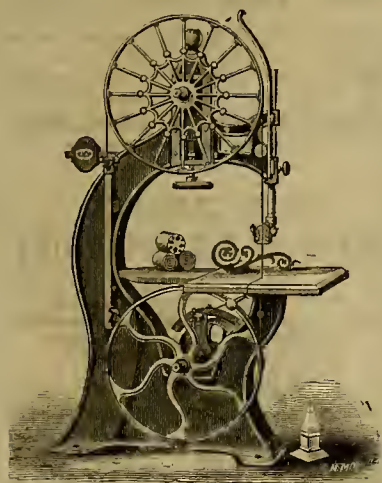
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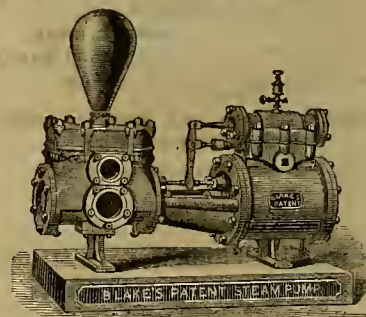
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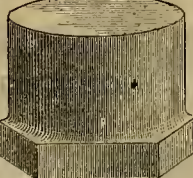
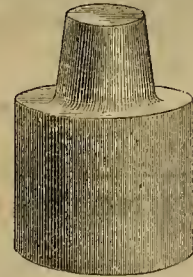
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Address all orders, with dimensions, to W. R. Townsend, Secretary.

1729-3m

CAST STEEL SHOE & DIE CO., Room 14, Academy Building, S. F.

SAVE \$50! WHY PAY \$85?

SEWING MACHINES.

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These Machines are superior to any and all; nice sewers, straight needle, two threads, shuttle, lock-stitch, the simplest and cheapest, and the lightest running first-class Machines in the market. To see is to convince yourselves.

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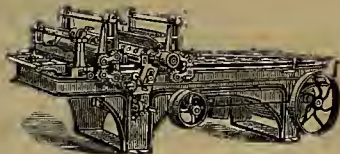
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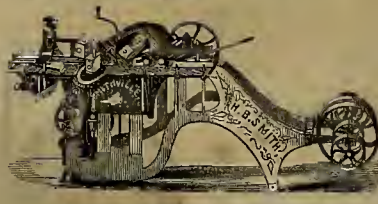


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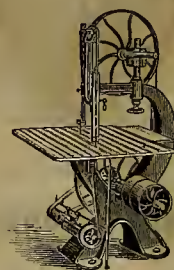
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Smith's Celebrated Molders.

We have four sizes of these Machines always on hand—"B," "C," "D" and "E,"—to work either three or four sides. Have slotted heads and all other improvements, and may be seen in any mill on the Coast. *Best Prices reduced to 15 per cent. less than Eastern list.* We have also, a large stock of all kinds of Planing Mill Machinery, such as Molders, Mortisers, Tenoners, Band and Jig Saws, etc. Send for our new Illustrated Catalogue. TREADWELL & CO.



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All kinds and sizes on hand, or made to order; guaranteed of unsurpassed quality, and manufactured of any length. FLAT ROPES, ROUND ROPES and TAPER ROPES, OF IRON OR STEEL.

Patent Endless Wire Ropeway

(WIRE TRAMWAY.)
FOR THE RAPID AND ECONOMICAL TRANSPORTATION OF ORES AND OTHER MATERIAL OVER MOUNTAINOUS AND DIFFICULT ROADS.

This system has been in use for over three years, and given thorough satisfaction.

PATENT GRIP PULLEY,

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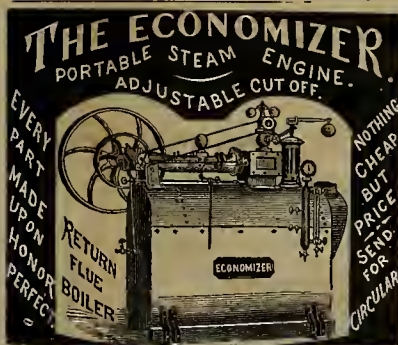
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1845.

CHARTER PERPETUAL.

1875.

Economy, Security.

Mutual Benefit Life Insurance Company

NEWARK, N. J.

Assets, January 1st, 1875, - - - \$30,533,429 94

LEWIS C. GROVER, Pres't. L. SPENCER GOBLE, Vice Pres't.
Edward A. Strong, Sec'y. Bsnj. C. Miller, Treas. B. J. Miller, Actuary.

The following is a summary of the business of this Company from May 1, 1845:

Total Receipts,	\$74,397,520 70
Paid Losses and Endowments,	17,187,583 28
" Dividends or Return Premiums,	16,362,010 85
" Surrendered Policies,	3,714,825 68
" Expense—Management, Commissions, Taxes, etc.,	7,471,171 52
The Ratios are:—	
Retained for Insurance Fund and Surplus	\$39.07
Returned Members and Families	50.09
Expenses,	10.04

These results are more favorable to the Insured than those presented by any Company in the World.

ALL KINDS OF APPROVED POLICIES ISSUED.

Dividends paid annually, or they can be applied on the Accelerative Endowment Plan, as ORIGINATED BY THIS COMPANY, to which particular attention is called.

ACCELERATIVE ENDOWMENT PLAN.

The plan is intended to meet the wants of those who wish protection for their dependents in case of premature death, and at the same time to make a wise provision for themselves in the event of surviving the productive period of life.

The plan proposes that instead of using dividends in reduction of the annual premium, the insured may at his discretion, pay his premiums in full in cash, and surrender his dividends to the company. In consideration of this surrender, the company will agree to pay the sum assured when the policy holder shall have attained a certain age, or at his previous death, instead of at death only thus enabling him to procure an Endowment Policy at the usual rates charged for policies payable at death only.

If the policy is already an endowment, payable at a given age or previous death, the surrender of the dividend will enable the company to agree to pay the policy at a still younger age.

Advantages of the Accelerative Endowment Plan

Over any other yet offered to the public, will be apparent when the following features are considered:

It can be applied to any policy, whether "Life" or "Endowment," to old business as well as new, where there is no premium loan, or where the existing premium loan shall be paid off.

It enables one to obtain an "Endowment" policy at the usual "Life" rates.

The expenses incident to this form of "Endowment" insurance, being no greater than in case of "Life" policies, its superiority to the old style endowment will be readily perceived.

It not only has the effect of constantly reducing the age at which the company will agree to pay the policy, but also, every dividend so applied becomes itself the source of future surplus, thus causing the dividends to increase much more rapidly from year to year than would be the case if they were used in payment of the annual premiums.

The assured can, in any year, apply his dividend in payment of premium, and allow the time at which the policy matures to remain as at the previous year's settlement.

As each dividend is surrendered, the company will make a positive agreement as to the time at which the policy will be paid, and the amount payable at such time.

If at any time the assured becomes disappointed or dissatisfied with the plan, he is at liberty to use his future dividends in payment of premium, and to retain all the advantages accruing from the surrender of past dividends.

If at any time the party should be unable or unwilling to continue payment of premiums, the company will, within three months from the date of lapse, allow the equitable value of the policy in paid-up insurance.

The Mutual Benefit Life Insurance Company issues Policies insuring the lives of healthy persons residing in any part of the United States.

JAMES MUNSELL, Jr., Agent of Insured.

And Acting Agent for persons desiring Life Insurance.

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E. B. Smith, for nearly twenty years engaged in the direction of mines and mining enterprises, can be engaged to take charge of any legitimate mining enterprise. Mr. Smith thoroughly understands the "Sonora" process of chlorination and lixiviation, being the originator of the same, and the erection of a new chimney and furnaces for the treatment of rebellious ores.

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Civil Engineering in all its branches. Pneumatic Engineering a specialty.

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Each Saw is Warranted in every respect:

Particular attention paid to construction of

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BRASS and BELL FOUNDRY
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MANUFACTURER AND IMPORTER OF
Church and Steamboat BELLS and GONGS,
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DOCK HYDRANTS,
GARDEN HYDRANTS.

A General Assortment of Engineers' Finding.

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STEAM PUMP

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ROOTS' BLAST BLOWERS.

For Ventilating Mines and for Smelting Works.

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For Mining Purposes.

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ALL KINDS OF

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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO.,
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SAN FRANCISCO, SATURDAY, JANUARY 29, 1876.

VOLUME XXIII
Number 5.

The Fryer Process.

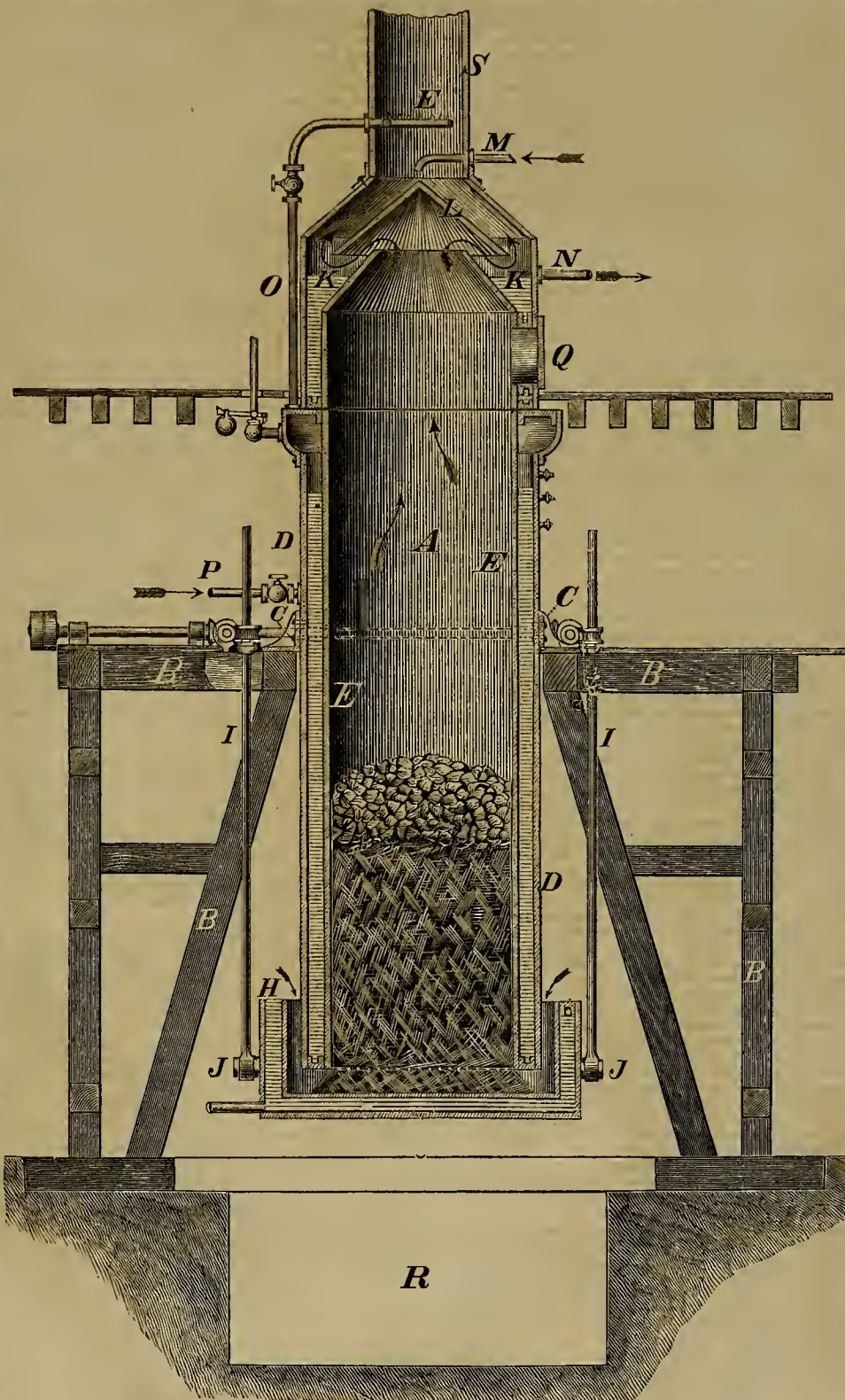
So much interest has been manifested in the Fryer process of working ores, and so much anxiety to learn the details, that we take pleasure in presenting to our readers this week a detailed description and engraving of the furnace used in the preliminary stages of the process. This will be followed in due time by a full description of the whole method, with illustrations showing the details of the other machinery, all of which is novel and different from what has heretofore been in use. The publication of this description, with the drawing of the furnace, is advisable in consequence of the false impression conveyed by the publication of what purports to be an abstract of Fryer's first patent. We corrected this erroneous impression in our last issue, and those interested can be convinced by examining the boxes of ore in the different stages of the process now at our editorial rooms.

In order that our readers may learn what Mr. Fryer claims, we give in full the following description, precisely as prepared for the specification for foreign patents, being a little different from the American patent in detail.

The object of this invention is more especially to facilitate and reduce the cost of the extraction of the gold and silver which is contained in quartz, but it may also be applied to the separation of the noble metals from other ores in which they may be contained with the base metals.

The invention consists in a furnace of upright cylindrical form, which has a double wall or shell of boiler plate or other iron for containing water and steam, and a suspended invertible or removable bottom, and has in its upper part a cone, around which the gaseous products of combustion in the furnace may escape to a stack above, and upon the exterior of which is delivered water, which falls over its edges and meets the gaseous and volatile products escaping from the furnace, and condenses certain metallic and other portions of said products, which fall with the said water and are collected therewith in a suitable receptacle, while the ore is being roasted in the furnace by the combustion of wood, upon which the said ore is deposited therein. Air is freely supplied to the said furnace through an annular opening provided around its removable or invertible bottom, for the combustion of the fuel and the oxidation of the oxidizable portions of the ore; and this supply of air is or may be increased by the steam which is generated by the heat of the interior of the furnace from the water in its double shell, and introduced in jets to the stack to act as a blower, the water also serving to prevent the rapid burning or oxidation of the inner shell or wall of the furnace. The suspended removable or invertible bottom serves to permit the rapid discharge of the contents of this furnace after the roasting has been completed. By the roasting process in this furnace the noble metals are to such an extent separated from the mineral matters and the base metals which are oxidized by the roasting process, that their complete separation may be easily effected by pulverization and subsequent amalgamation, the ore having been brought to such condition by the roasting process that its complete reduction to an exceedingly fine powder is very greatly facilitated.

The invention is illustrated in the accompanying drawing, which represents a central vertical section of the furnace.



FURNACE USED IN PRELIMINARY STAGES OF THE FRYER PROCESS.

The body, A, of the furnace, constituting the furnace proper, is of upright cylindrical form, open at the top and bottom, and suspended on or in a frame work, B, by legs, C. This furnace is constructed of boiler plate or other iron, with a double shell, D E. Between the shell, D E, a water and steam space is provided, the object of which is, in the first place, to pre-

vent the inner shell, E, from rapidly burning out; and in the second place, to provide steam with which to supply a steam jet blower, F, located in the stack S, above the furnace.

H is the bottom of the furnace, made in the form of an open vessel of an internal diameter larger than the external diameter of the body of the furnace, and constructed with a double

shell, having a water space to prevent rapid oxidation of the interior. The said bottom is suspended from the frame, B, by rods, I, connecting therewith by trunnions, J, and with apparatus overhead, by means of which the said bottom may be raised, and lowered at pleasure. K is a double-shell chamber situated at the top of the body of the furnace, and through the inner shell of which the gaseous products of combustion and volatile matters from the furnace pass to the stack, S, which is erected above said chamber. The space between the two shells of this chamber, K, contains water, which prevents the burning out of the inner shell.

L is a cone, which is located as shown, over the upper portion of the inner shell of the chamber, K, and upon which is delivered a stream of water through a pipe, M, which water comes in contact with said products as they pass in the direction indicated by the arrows, and afterwards falls into the space between the inner and outer shells of the chamber, K. N is an overflow pipe for conducting off the water from the space between the shells of the chamber, K, after it has performed the operation of condensing the volatile metalloids and some other products of combustion which have been evolved from the furnace and which are collected in the said space. O is a pipe for conducting steam from the space surrounding the body of the furnace to the blower, F. P is a pipe for feeding water to the above mentioned space.

The operation of the furnace is as follows: Wood is delivered to the furnace through the door, Q, until the same is filled to about the height shown, when the quartz or ore to be treated is delivered in the same manner, in lumps of any size that will enter the furnace, on to the top of the wood, which is then ignited at the bottom. The result is that the principal portion of the wood is converted into charcoal before a great amount of the same is consumed; after which the whole charge is gradually raised to a very high temperature in the presence of a large flow of air entering the furnace between the body, A, and the bottom, H, as indicated by arrows—the influx of said air being urged by the action of the blower as soon as sufficient steam is generated. The effect is that the sulphur and other volatile matters are mostly expelled, while the base metals are converted into oxides in the furnace, leaving the noble metals in comparatively a free state for amalgamation.

The relative quantities of ore and fuel supplied to the furnace may be about one and a quarter cords of wood to four tons of ore, or in like proportion according to the capacity of the furnace; but these proportions may be varied according to the nature of the ore under treatment.

After the charge of fuel has completely burned out, the bottom, H, is lowered and turned upon its trunnions sufficiently to precipitate the contents of the furnace into a pit, R, below, or into or on any other suitable place or receptacle, from whence it may be gathered for further treatment. The bottom is then replaced in the position shown in the drawing, when it is ready to receive another charge for a repetition of the operation.

SLEIGHING is again good at Virginia City, and considerable ore is being hauled on sleds. Icicles from five to ten feet long are also a prominent feature of the place at present, hanging from the roofs of every house.

THE smelters and silver mills of Utah propose giving the product of one day's run to swell the exhibit at the Centennial.

Working Quicksilver Ores.

We give herewith an article from the *Berg und Huettenwesenmaennischen Zeitung*, the translation of which has been kindly furnished us by Mr. J. B. Randol, manager of the New Almaden mine. It describes a new process of working quicksilver ores, proposed by Emil Pellet.

In the *Revista Minera*, Vol. XXII, as also in this journal, Vol. XXXI, 1872, on the 410th and following pages is mentioned a new process for the reduction of cinnabar ores, by Emil Pellet, and on the 309th and following pages of the first mentioned publication, is a review by Ygnacio Gomez Salazar, of the results of the trials of said process, made in the year 1869, at the works of Almaden, in Spain, under the direction of the mining inspector, Don Jose Monasterio y Correa, and which appears in his official report, the statements of which may prove of interest, as no further details about this process have been published since. In Vol. XXIX, 1871, of the *Revue Universelle des Mines*, etc., by de Cuyper, is on the first and following pages a communication about the quicksilver mines of Almaden, by Jose Monasterio y Correa, and at the end of it is promised, also, a description of the process employed in Almaden for the reduction of ores, but as this has not appeared as yet, the following remarks of Salazar on the results which were produced by the experimental tests of Pellet's process may find a place here.

According to the statements of Salazar, Pellet asserted that he had discovered a process for which he claimed the following advantages:

1. No loss of quicksilver contained in the ore.
2. Curtailing of the expenses of working the ore and of fuel.
3. No losses of quicksilver by vaporization, explosion, or imperfection of apparatus.
4. Reduction of the ore in the state in which it is mined, wet or dry, in large or small pieces.
5. Uninterrupted working throughout the year, regardless of the state of the atmosphere.
6. Low cost of the apparatus and inconsiderable repairs.
7. Safety of the health of workmen.

These great advantages of the new process were considered for the works of Almaden of the greatest importance, and each one of the advantages claimed was regarded as meriting a reward; hence, the government of Spain willingly offered opportunities and means to test the new process at the reduction works of Almaden, under the management of Monasterio and Arceaga, who were directed to report upon the results in detail. Monasterio asserts in his report that all conjectures of the inventor of the tested process had proved themselves to be incorrect. The loss of quicksilver, which Pellet had promised to avoid entirely, had been found to be doubled. The cost of reduction had been four and a half times greater than the expenses of the old process, which had been used in Almaden over seventy years, and the escape of quicksilver (volatilization,) through cracks, and in every conceivable manner, had caused great losses. Neither in the dry nor in the wet state, neither in small nor in large pieces had they been able to reduce the ore as it had been mined; and after breaking with the hammer the ore had suffered losses in every state of the atmosphere in summer and winter; and also the health of the workmen who were employed for the Pellet process had suffered considerable injury.

According to the process, by Pellet, the distillation of the volatile parts of the ore is effected by means of a continuous roasting in place of the intermittent roasting and the condensation in the atmosphere is replaced by a condensation under water. Salazar further asserts that the process of Pellet respecting the two above mentioned deviations from the usual process of Almaden had been previously tried in Spain and other countries with unfavorable results. The use of water for the condensation of mercurial vapors could not properly be regarded as the invention of Pellet, for the use of rain had been proposed, but rejected, for the attainment of the same object; and the proposed condensation of these vapors through a mass of water of five millimeters did not promise favorable results. The application of a current of air, created by a ventilator, placed at the base of the furnace was neither new nor proper, and in the case under consideration did not serve its purpose, and the arrangement of the contrivance was like many others, whose main part consisted in a system of chambers. Based upon these facts, Salazar believes to be justified in regarding the process of Pellet as one which, although based upon good principles, through their misapplication formed an aggregation totally unfit for the accomplishment of the desired object.

In accordance with Salazar's assertion the unfavorable result obtained of the competitive trial at Almaden cannot be ascribed to the retention of means and resources, as an unlimited supply of them with most favorable opportunities for their application had been accorded to Pellet. He was permitted to make a preliminary trial, and to introduce for the decisive trial several important modifications, suggested by the results of the prior trial. Pellet's process of reduction was placed in comparison

with the results of a furnace in Idria, which produced less than the older furnace of Bustamante, and the competitive trial took place in the hot season, which is the most unfavorable season of the year for the Idria furnace. Balls of coal dust, which are always used in charging the Idria furnace, were omitted in the trial charge, for Pellet did not use them. This was a disadvantage for the Idria furnace.

Notwithstanding the equality of the charges placed in both furnaces, Pellet protested against the coat of cement with which the interior of the Idria furnace was lined. But to bring about in this instance also an equality, Pellet's furnace was also lined with a coat of cement. Pellet asserted that the above mentioned coat of cement belonged to his invention, and drew from this the inference that the unfavorable difference of the obtained results at the trial was owing to this trifling.

Salazar says he would not have mentioned this assertion of Pellet's if Monasterio in his report had not spoken in favor of it. But he would remark to both, that neither the cement nor its application belonged to the invention of Mr. Pellet, and that the cement coating of the furnaces of Almaden had been proposed many years previously by a mining engineer of Spain.

Omitting the other critical comments of the report of Monasterio, we shall make the following extracts from the communication of Salazar, page 392, etc., and 494 of the *Revista Minera*. The mind of Pellet was not set at rest by the failure of the trial of his process at Almaden, but he gave it another test at Albulon, to which Salazar had been previously invited, but the invitation was declined for the following reasons: Pellet had offered his process to the Spanish government in 1867, claiming for it the above mentioned advantages; he had requested the government to compare the results obtained by his process with those of the process then in use at Almaden; he had further requested the appointment of a committee of experts, and in case the committee should report in favor of his process to grant him a reward, which, according to the estimation of Pellet, would have amounted to 15,000,000 reales.

Regarding the improvements in the process of reduction and the preservation of the health of the workmen, the government had referred the petition to the highest mining authority, which had agreed with Pellet to test his process under the following conditions: The reduction of the quicksilver ore, taken from the same pile, should take place simultaneously in two furnaces, one to be constructed according to the direction of Pellet, and the others to be modeled after the furnaces then used in Almaden, and the obtained results to be placed side by side for comparison. Pellet had received, with the greatest readiness, during his presence of two years at Almaden, and even before the beginning of his principal trial, all the required means and assistance, and furthermore in a preliminary trial for the discovery of some possible defects, he had been materially aided. Workmen for the training in the work of the new process had been placed under his charge, and in every respect the greatest possible latitude in his actions had been granted to him. But notwithstanding these opportunities favorable to success, a large number of laborers had got sick and a smaller yield of quicksilver had been obtained, and without counting the costs of erection, the expenses had been greater than usual at the works of Almaden. Pellet had acknowledged the trial and the obtained results, but after an expiration of two years he had rejected the trial and had insinuated that Monasterio was responsible for the failure, and therefore he, Salazar, could not accept the invitation to Albulon. Salazar asserts further that the failures of both trials in Almaden and Albulon had not been sufficient to refrain Pellet from making a third trial. Pellet had transferred his invention to a company to which the Spanish government had granted a repetition of another trial. Salazar does not doubt that this would be another competitive trial, that one furnace would be constructed according to Pellet's direction, and the other after the Almaden old style, that in both the same quality of ore would be used, and that all necessary caution would be taken at the trial. He also thinks it indispensable not to lose sight of the experience already gained at the former trials, and to guard against any error which might give a right to the inventor to claim the premium of \$15,000,000 reales. He (Salazar) thinks the decision of the new trials of Pellet's process under all circumstances, as determined for the following reasons:

1. The appointed commissioners possess the most extensive knowledge of mining and reducing quicksilver ore.
2. In case this trial should result in favor of Pellet's process, it would be imperative that another trial should be ordered, to decide the contradictory results of the trials so far made.

In the following Vol. XXIII of the *Revista Minera* no mention is made of Pellet's process, with the exception of a single allusion to the first unsuccessful trial, and as Salazar (page 389, etc., of this Vol.), when speaking of some objections which had been made against the furnace of Bustamante, commends the said furnace, it would appear that the trial had not then taken place. Salazar will doubtless publish in the *Revista Minera* the results of the new trial as soon as it shall have ended, and will at the same time make publicly known the peculiarities of Pellet's process and the application of the contrivance employed.

Rich gold mines have been discovered on Upper Four Mile river, Colorado.

The Snake River Mines.

A correspondent of the *Idaho Statesman* writes of these mines as follows:

Work is being prosecuted vigorously on the various ledges; there are four companies "hard at it." Ruth & Heath have struck richer ore than even the best they ever had before; the fissure is true and well defined. The ore they now get will assay well up in the thousands. Some of the rock is literally held together by horn silver, and rich chlorides are as abundant as ever.

In the Picayune ledge, which is copper ore, and assaying up to \$150 in gold, Dave Bridgeman & Charley Sampson are preparing to run a tunnel to tap the ledge about forty feet from the surface. This ledge is about ten feet wide, and can be traced for over half a mile. There are three locations of fifteen hundred feet each taken upon it. First, on the discovery, by Hoover & Parker; second, Bridgeman & Co.; and the last, by Hon. Mose Biddy & W. Angle, of Horseshoe Bend.

On the Alpha ledge F. J. Parker is at present going it alone. The indications are more favorable than ever. The ledge is so wide that it has taken "beaps" of work to discover the best place to sink a shaft. The company having found it, they will shortly double the working power and work the best part of the winter.

William West will shortly go in on the Katie Halley ledge. At present Billy is trying to bring order out of chaos at the mouth of Brownlee creek, making a good wagon road, which, with the road the Union county (Ogn.) powers that be are making for Pine valley, will place us in direct communication with the Columbia river. There yet remains about ten miles of road to place us in communication with Boise City.

In this camp the bosom of mother earth is bare. Grass was never in better condition for stock. The weather is mild and we have good reasons for expecting a very open winter; but the end is not yet.

It is a great pity that we have not more men in here to prospect this winter. They would have good chances to benefit themselves and the country; but I have harped on this string until I am tired. We have not actually had more than two men in camp this year at all acquainted with quartz, outside of those who are now here. Along came a few broken miners looking for two or five dollar placer diggings. "They come like shadows and so depart," and through ignorance, and as a salve to their own minds, spread the report that the whole country is not worth a cent. I fear that the wish is father to the thought. If they had worked around and prospected, I could not blame them; but those to whom I allude never stooped a pick in the ground, and some never saw a prospect hole while they were here. Pecuniarily, it is a matter of the most perfect indifference to us whether we get a population or not. We know that it depends on ourselves to develop the camp, and if we have a good thing, we alone shall benefit by it; but the reason for this growl is that no miner likes to see his camp run down by those whose motives are dictated solely by envy and malice.

Cornucopia District.

A correspondent of the *Silver State*, writing from Cornucopia, says: That our camp is going to be one of the best on the coast next summer, there is no doubt. The Leopard shipped a little over \$85,000 last month. They shut down twenty-four hours for repairs, but are in successful operation now, and will probably continue so all winter, notwithstanding what the croakers may say. All we want is a good outlet during the year around.

I obtained some items the other day in relation to the Leopard mine from an old and experienced miner, Geo. W. Tucker, who informs me that the mine is prospected to the depth of 187 feet, and that in their tunnels, drifts, etc., they have at least one thousand tons of good ore in sight. The claim is bounded on the southwest by a change of formation from what it used to be, and they are now running south-east and northwest. It is bounded on the west by an iron formation.

The Hussey mine is located on the northwest end of the hill, and is now down to the depth of 347 feet, and develops a large body of ore bearing southeast. Along the line of the Leopard and Hussey comes in the Consolidated Cornucopia on the southeast, which bears the same character of ore as the Leopard and Hussey, and is worked to the depth of 116 feet, and is now in good sulphuretted ore, and everything proves the fact without doubt, that it is a good fissure vein. Other mines might be mentioned, but I defer it to some other time.

REPAIRING.—Everything in and about the Eberhardt & Aurora company's mill looks busy. The whole institution is undergoing general repairs, and when finished will be quite as good as an entire new mill. It will be recollected that the present mill was resurrected from the one that passed through the fire, and which has done admirable service during past year. We learn that all the old pans are to be replaced with new ones, and that extensive repairs will be made to the stamps. Perley Rowell is master of the situation, and has all the millwrights, machinists and blacksmiths at work that can be employed. He expects to have it running again in about three weeks.—*White Pine News*, Jan. 15th.

Big Blasts.

We noticed some months since, in an exchange, an account of a big blast doing splendid execution, consisting of seventeen kegs of powder, and we frequently observe statements of big blasts consisting of from fifty to one hundred kegs. Had the writers thereof added that they were big blasts for their districts, they probably would have told the truth.

A few days since we witnessed what to us was the largest blast we ever saw. It consisted of three hundred and fifteen kegs of powder, and to say that it was a big blast would not be doing Col. Ludlum, the superintendent of the Cedar Creek company, justice, for the reason that he only considers it a medium affair, not of sufficient importance even to let the citizens know when it was coming off, and we doubt if fifty persons knew that such a blast was being proposed, and many of the inhabitants of our little town will hear of it first through this article.

Should those parties who call seventeen kegs a big blast take the trouble to visit this district, Smartsville or You Bet, they will probably learn something of bank blasting.

The blast above referred to, as before stated, consisted of three hundred and fifteen kegs of powder, which were placed under a bank about one hundred feet in height and distributed in seven chambers cut into the hard cemented blue gravel; the powder was placed therein and the drifts leading to the chambers, all tamped solid with earth and boulders; Col. Ludlum always takes the precaution to place a string of fuse leading to each chamber of powder in addition to the electrical wires, which as he says assures success in case the wires are broken.

At the time agreed upon the labor of tamping up the drift, which had been going on for the previous thirty-six hours, was completed and it was announced that all was ready. The men appointed for the duty were instructed to light the fuse, which they obeyed, and on their return the command was given "ready," "fire," the party operating the electric battery gave twenty rapid turns at the right and half a turn to the left, at which instant all eyes that were centered on the spot witnessed the hill rise up about eight feet, an apparent shuddering of the immense body and the bank settled back crushed; nothing remained to exhibit the action of the instantaneous explosion or the 7,875 pounds of powder but the rising smoke and the crumbling mass of gravel.

To say that we were disappointed does not do justice to the subject, we were more than that; we were surprised that such a quantity of powder could be exploded so near to where we were standing and affect us so little; we expected at least to hear a terrible report, that the earth beneath us would shake, tremble, and that we should witness an upheaval of immense numbers of cobbles, but no such demonstration took place; to us it seemed like a tame affair until we approached the crumbled bank and realized what immense power was necessary to lift up and hurl down with crushing effect such an immense pile of gravel.

Parties familiar with such operations pronounce it a perfect success, and state that it has loosened material sufficient to keep the claim washing for at least a month to come. From the appearance of the bank we conclude that the gravel is rich, and notwithstanding the cost of this blast for labor and powder has exceeded two thousand dollars, the company will undoubtedly be remunerated for its outlay.—*Dutch Flat Forum*.

The Wagontown Mines.

The Idaho *Avalanche* says: From Mr. B. Wilbur, who was in town yesterday from the Wagontown mines we learn that Messrs. Peters, Ponlin, Oglesby and Warren have resumed operations on the Henrietta mine, and are now working a force of ten men. It is their intention to develop the mine with all possible dispatch and take out a large quantity of the rich ore for which it is famous.

The Maggie continues to show up splendidly. Four tons of ore were taken out the other day, which is very similar in quality to the rich ore extracted from the Henrietta last fall, and which yielded away up among the hundreds per ton. We understand that the Maggie will have steam hoisting works before long. This looks like business, and demonstrates the fact that the company are well satisfied in regard to the future prospects of their mine. The Maggie starts out under very favorable auspices.

Houses are in great demand and rents are very high in the district. A small house situated close to the Maggie and Henrietta mines rents for \$24 a week, and the most insignificant log cabin thereabouts is readily sought after at \$25 per month. Mine owners in general are jubilant over their prospects, and we confidently believe that within a period of eight months the new district will have a population of at least 1,000 people. Next summer several incorporated companies will be operating; quartz mills will be erected, and lively times will prevail.

LEAVES of the pine-apple, now being extensively cultivated in the East Indies, are turned to account by being converted into a kind of wadding, which is used for upholstering instead of hair. A sort of flannel is also manufactured from them, from which substantial waistcoats and shirts can be made.

MECHANICAL PROGRESS.

Glass Journal Boxes.

Within a comparatively recent period there has been commenced, by Messrs. Campbell, Jones & Co., the manufacture of glass journal boxes designed to supplant the brass boxes now in use. Proper molds have been made, and one pot of glass of a peculiar "mix" has been fashioned into the article. One car on the Citizens' passenger railway, Penn street, has been provided with these boxes, and the experience of seven days speaks very favorably for them. Other cars of the same line will soon be supplied, and meanwhile a car on the P. & B. line will be fitted up with the new boxes. The experiment was recently tried in one of our planing mills to use a glass box for the journal of a saw shaft, and the result was highly satisfactory. The common supposition is that the lack of friction would do away entirely with oil, but Mr. Jones, of the firm, advocates the use of a very small portion of lubricating fluid, as is much safer.

Several boxes have been submitted to the test of hydraulic pressure, and the following results obtained: A box made of ordinary glass sustained a pressure of ten thousand pounds to the square inch before cracking. A box made of the special "mix" required a pressure of twenty-seven thousand pounds to shatter it; so it is plain that the special "mix" is best. The mode of tempering, too, is slightly different from the plan commonly in use.

Although the idea of making glass journal boxes is not a new one, yet this is the first instance of their being successfully made. Messrs. Campbell, Jones & Co. have had assigned to them the rights of an inventor of glass slide bearings, and with their own patent rights possess a clear field in the market. We have just seen an experimental machine at their glass works, the shaft of which has seven hundred and seventy-two revolutions to the minute. It had been running for four hours continuously, and both the boxes and shaft were perfectly cool.—*Pittsburg Herald*.

A NEW SPARK ARRESTER.—Mr. Wm. Stamp, a machinist employed in the Erie railway shop in Susquehanna, Pa., has patented an improved invention for preventing sparks and cinders from flying out of the smoke stack of a locomotive. His exhaust has a spiral channel connecting with a similar channel in the smoke stack, giving the cinders a centrifugal force that sends them against the inside of the stack, whence they are conducted to the ground. They can be retained if necessary, and deposited at any point along the railway. If this invention can be made practicable, it is calculated that locomotives can burn with less coal, and passengers can raise the windows without having their eyes filled with cinders or soiling their clothes. The engineer can keep a better lookout, and the cars may be thoroughly ventilated without annoyance. So sanguine is Mr. Stamp of the success of his invention that he offers to give two stacks to any company having more than ten locomotives, and pay all expenses if the result is not satisfactory. Any company having twenty-five locomotives can have patterns to build four stacks, a company with fifty can have ten, and a company owning two hundred locomotives can build twenty stacks free of charge for patents, if built within six months.

AN IRON CARRIAGE WHEEL.—A new principle in the construction of carriage wheels has been brought to notice by an English inventor—every part of the same consisting of wrought iron, with the exception of the tire, which is formed of the best cast steel. The method of fastening the spokes—which are hollow—both in the rim and in the boss, is such, it is claimed, as to insure safety by the simplest means. The tire is so constructed as to protect the other parts of the wheel when it runs against the carstone, or comes in contact with another vehicle. Neither in patting on the tire, nor indeed any portion of the work, is a single bolt or nail employed, the spokes being clipped into their places in the rim and boss, and afterward locked up by a nut, while the tire is firmly inserted into a groove in the rim. The strength of the axle-tree is increased at the points where it is most liable to give way, and the boss is made to accommodate about four times the usual quantity of oil for lubricating purposes. Although made of iron and steel, the wheel is not more than two or three pounds heavier than the ordinary kind.

COIL BOILERS, or steam generators formed of one continuous coil of iron pipe, are coming into use again to some extent, although they are by no means new. They are used for small powers, for steam launches, and for stationary purposes, and make a cheap and, for the time being, serviceable evaporator.

CASE-HARDENING IRON.—A simple method of case-hardening iron is to sprinkle powdered prussiate of potash over it at a red heat, and plunge it into water; bichromate of potash with the pith of ram's horn may be used, with good results, instead of the prussiate.

Magnetic Separation of Iron and Steel.

Some time ago we called attention to certain machines which were employed on the river St. Lawrence, in Canada, for concentrating by means of magnetism the ferruginous sands so abundant in those parts, and in which the iron existed in the state of the native magnetic oxide of this metal; we now call attention to a somewhat similar arrangement called a magneto-mechanical separator, which has for its object the separation of iron and steel filings from the copper, brass and other filings which accumulate in the workshops. The machine is the invention of Mr. Charles Vavin, and was described by M. Bonillet at the meeting of the 1st May of the Societe d'Encouragement des Arts, etc. We must refer to the original source for details, but it may be mentioned that the mixed filings fall on two cylinders placed one above the other, and furnished with rings of soft iron, which are rendered magnetic by strong artificial horse-shoe magnets of iron, placed as radii. Effective arrangements are made in order to render active the entire surface of the cylinders, and a brush of pig's bristles detaches the adherent filings. It is stated that the separation proceeds very well, and that a machine not costing more than £50 is capable of cleaning half a ton of filings per day. Judging from the description, however, we should be inclined to give preference to the machine used at Quebec, which has already been noticed in a former report.—*Iron Age*.

SOMETHING NEW IN BOILER FLUES.—The National tube works company, of McKeesport, Pa., says the *Times*, are now manufacturing wrought iron lap-welded tubes in all sizes up to fifteen inches diameter, the larger of which are now being adopted on our steamboats for boiler flues, instead of the riveted flues, and a large number of steamers are now using them. These tubes are giving satisfaction, and the local inspector at Cincinnati says they have proven themselves all that could be desired. There are many advantages claimed for these tubes as flues, among which we might mention the following: They are cylindrical in form, a point not claimed for the riveted flue, thereby lessening the chances of collapsing, if not absolutely preventing accidents of this kind. There are no rivet heads or laps to interfere with the draft, and consequently the flues are not liable to choke up with soot, are much less apt to scale, and, having a smooth unbroken surface, are of course much more easily cleaned, a fact that will be appreciated by the firemen. Another point claimed is that they are of uniform gauge, having no rivets or laps, and must naturally require much less fuel, a fact that will undoubtedly receive due consideration.

THE LARGEST GLASS CYLINDER IN THE WORLD. Mr. Thomas Degnan, of the Union glass works, in Somerville, Mass., recently made an enormous glass cylindrical shade or cover for a statue which is to be exhibited at the Centennial. The process began by inserting a long hollow iron tube into the pot of molten glass, and by careful manipulation about 75 lbs. of the latter was caused to adhere to the tube. This was then taken to a wooden mold of semi-circular form, in which it was rolled a few times by three men, and thus brought to a white heat. It was then taken to a wooden cylinder placed beneath the floor of the factory; and after it was placed therein, Mr. Degnan began the work of fashioning the cylinder to its proper proportion, which he did by blowing through the iron tube and into the body of the glass; while at the same time, two men, guided by a wave of his hand, raised and lowered the glowing cylinder gently but quickly until it came forth finished, and measured 5 feet in height and 74 inches in circumference.

NEW MODE OF RAIL CONSTRUCTION.—An American rail manufacturer prepares rails partly in steel and partly in iron, by grooving a bar of iron to a good depth on its sides, and placing the bar, at a proper heat, in the ingot mold, upon the liquid steel which has been run into it. A perfect weld is obtained, and the bar is rolled by the usual process.

INDUSTRIAL progress appears to be interminable; the first step of conceiving labor-saving machinery was only a beginning, as, not content with this, the inventive genius of our practical men cannot rest, but is continually improving on existing machinery; hence the improved contrivances of different kinds which come continually under our notice.

STEEL SHIPS.—The British Admiralty having decided upon the construction of two dispatch vessels to be made entirely of steel, the order for the plates and bars for the same has been given to the Landore Siemens steel company, of Swansea, who undertake to supply a very mild steel of high quality. These vessels will be built at Pembroke dockyard.

SOFTENING CASTINGS.—Place the casting, surrounded by sawdust, in an iron box; close it up with clay, to exclude the air, and subject it to a red heat for several hours; the castings must be cold before they are withdrawn.

SCIENTIFIC PROGRESS.

The Uses of Ozone.

Our readers are, no doubt, generally familiar with the chemical nature of ozone, and with the modes of preparing it for chemical purposes, by electrical action upon atmospheric air. Ozone, it will be borne in mind, is merely a modification of oxygen, just as plum-bago is one modification of carbon while the diamond is another. Ozone differs from ordinary oxygen, in the fact that it is far more energetic in its action—oxidizing rapidly metals and other substances which are effected by oxygen only after long exposure. Its specific gravity is one half greater than common oxygen. It possesses a most marked odor, while oxygen is odorless. This odor is easily recognized in the atmosphere, during and immediately after a severe thunder storm. It is a slightly sulphurous smell. It is this characteristic which gives it the name ozone, from *ozein*, a Greek word, meaning to smell.

From a mere laboratory curiosity ozone has now become largely employed in medical practice and in the arts; and its use would be rapidly increased if some means could be devised for producing it cheaply and on a large scale. Various processes for its manufacture have already been patented in Europe; but as yet none appear to have any practical value.

Lender has established a manufactory for ozone in Germany, and ozone inhalations may be had for about twenty cents per cubic foot of the gas. Ozonized matter is also sold for twenty-five cents per bottle.

The first patent for the application of ozone to manufacturing purposes was recently granted in England. Under this patent acetic acid is formed from alcohol without fermentation. The ozone is obtained by blowing air through a flame and bringing it in contact with a current of alcohol. Whether the experiment will prove a practical success remains to be seen.

Cheap ozone might be largely employed for bleaching purposes. Grass bleaching is due to the presence of ozone in the atmosphere. In its nascent state, as produced by electricity during thunder storms, ozone oxidizes the nitrogen of the atmosphere, and we have nitric acid. It is from this source that rain water, which falls during a thunder storm, derives its large proportion of nitric acid.

The nitric acid of commerce is obtained from niter; but if ozone could be economically produced, it could doubtless be employed for preparing that acid by synthesis—as nature produces it.

Ozone has also been recommended as a disinfecting agent for the sick room, and various methods of generating it for this purpose have been proposed. One, which is commended for its simplicity, is by means of a mixture of the permanganate of potash and oxalic acid. Two spoonfuls of this in powder, moistened with double the quantity of water, a little more water being added every two hours, will emit ozone freely. Another method, even simpler, which is said to work well, is to dip a bunch or part of a bunch of common friction matches into water until they are thoroughly moistened, and then to expose them to the air in the room to be disinfected.

DOES SUNSHINE PUT OUT A FIRE?—A good deal of discussion has lately taken place in this country over the old question whether sunshine checks combustion. It is an old notion that sunshine lessens the intensity of a fire, and may even put it out, and the theory was that the sun's heat by expanding the air caused a diminished supply of oxygen to the coal. This and all other explanations are condemned and the fact is denied. One writer says that if a few pieces of charcoal are ignited in a chaffier, and placed in a sunny room provided with closely fitting shutters, the fire will appear to die away in the sun's light. But if the shutters are closed, the coal will be seen to be in full combustion. There is no phenomenon at all, but only the appearance of one, which is due not to the sun's heat, but to the fact that its light, being stronger than that of the coals, overcomes and subdues it. The fact of combustion is so intimately connected with glowing ignition in our minds, that anything which lessens the glow appears also to diminish the combustion.—*Cassell's Magazine*.

SCIENTIFIC SURVEYS.—The Secretary of the Interior, in his annual report, says: "The results of the geological and geographical survey of the Territories, conducted during the past session by Messrs. Hayden and Powell, under the direction of this department, will, it is believed, equal in interest and importance those of any previous year. The survey under F. V. Hayden continued its labors of the two preceding years in the Territory of Colorado. The survey of the southern and southwestern portions of Colorado has been completed. The total area surveyed was about 30,000 square miles, portions of which were rugged. The explorations of the remarkable pre-historic ruins of Southern Colorado, glimpses of which were obtained the preceding season, was continued with great success. The survey under J. W. Powell continued the labors of the preceding year in the Territory of Utah. Nearly 10,000 square miles of country were surveyed during the season just closed.

A New Explosive Copper Compound.

The dangerously explosive character of acetylen copper is well known. Many serious accidents have occurred from its presence—spontaneously formed—on copper pipes employed for conveying illuminating gas. Such accidents have resulted from slight blows with a hammer or some other iron tool given by workmen when engaged in making repairs, etc.

According to a German scientific journal, the *Polytechnisches Notizblatt*, another copper compound has recently been prepared, which, when mixed with chlorate of potash, forms an explosive, which it is proposed to use for filling percussion caps, torpedoes, etc.

The mode of producing this compound or salts of copper is as follows: To a solution of sulphite of copper is added enough hyposulphite of soda, in solution, to entirely destroy the blue color. To another portion of the blue vitriol solution, aqua ammonia is added, until the blue precipitate, at first formed, dissolves to a dark blue solution of ammonia—oxide of copper. The two solutions are now mixed; and after long standing, a violet colored salt crystallizes out of the beautiful blue liquor. It is this salt which becomes explosive when mixed with chlorate of potash.

The composition of the "violet colored salt" above referred to, and which constitutes the new explosive, is not given by the authority quoted; neither is any reference made to the probable cause of its explosive nature. It may possibly be due to the nitrogen imparted to it by the ammonia; or by a large proportion of sulphur which may be present, which latter substance, when in a free state, forms with chlorate of potash a mixture that detonates by percussion.

SCIENCE AND THE ARTS.—The Gramme electric machine promises to become one of the most valuable discoveries of modern times. This machine is now under the control of Mr. Werderman, of London, by whom it is gradually but surely being introduced into practical use, and bids fair to work quite a revolution in several important branches of industry. The greatest electro-plating house in the world, Christoffe & Co., of Paris, use ten of these machines, and no others. It is claimed that by its use aluminium may be made on a large scale, and at but a moiety of its present cost. Potassium, sodium, magnesium and caustic soda can be produced at a fraction of their present cost. Of its ultimate employment for telegraphing and general use for light-houses there can be but little doubt. But it is asserted that one of its most profitable uses will eventually be the reduction of refractory ores, such as sulphurets of gold and silver. And it is also hoped that it may yet be profitably applied to the reduction of iron ores. Iron may be produced quite free from sulphur, phosphorus and other impurities, so that steel may be produced directly from the smelting furnace.

THE NEW INVESTIGATIONS IN MAGNETISM.—MM. Treves and Durassier have recently investigated the question of whether, and how, in a steel magnet, the known portative force varies when the weight and section are affected by the gradual dissolution of the magnet in an acid. The result is that the force is always proportional to the section and to the weight, so that a curve representing the variation of weight and section would be parallel to one indicating the diminution of intensity. As the dissolution progresses, the metal shows serrated inequalities perpendicular to the axis of the bar; and if a horse-shoe magnet be treated the curved part is found to dissolve incomparably quicker than the straight portions.

THE ELECTRIC LIGHT has recently been applied for lighting the mills belonging to Messrs. Heilmann, Ducommun & Steinlein, in Muhlhausen. In a separate room four magneto-electric machines are placed, which feed four suitably located lamps constructed on the Serrin principle. The dimensions of the room are 196x98 feet. Each lamp gives a light equal to about 100 Carcel lamps. Each magneto-electric machine requires about 360 foot-pound motive power. The cost of the lamps, exclusive of the maintenance of the motive power, averages about 20 cts. per hour. The magneto-electric machines have each cost \$300, the whole arrangement amounting to 1,600.—*Electrical News*.

WATERPROOF TISSUES AND PAPER.—*Les Mondes* say that bichromate of potassa has the property of rendering gline and gelatin insoluble in water. Thus paper, and stuffs of cotton, linen, or silk, if once coated with this insoluble gline, become perfectly impervious. To render gline insoluble, it is sufficient to add to the water in which it is dissolved, one part of bichromate to fifty parts of gelatin. The addition is only made at the moment when the liquid is to be used. The process is conducted in full daylight. The Japanese make their umbrellas with paper prepared in this manner.

INTERESTING OPTICAL EXPERIMENT.—Prof. F. E. Nipher sends to *Nature* the following pretty optical experiment. Observe a white cloud through a plate of red glass with one eye, and through green glass with the other eye. After some moments transfer both eyes to the red glass, opening and closing each eye alternately. The strengthening of the red color in the eye, fatigued by its complementary green, is very striking. Many modifications of the experiment will readily suggest themselves.

and nuggets of gold worth \$5 and \$6 each are found scattered through the boxes, while coarse gold is visible almost anywhere in the bottom of the sluices. The owners are sanguine of securing an amount of gold at the next clean-up sufficient to leave a handsome margin after defraying all expenses. Traeb & Belliard, who are working the adjoining claim, known as the Montreal mine, are within a few hours' work of the principal auriferous channel.

CALAVERAS.

EXTREMELY RICH ORE.—Calaveras Chronicle, Jan. 22: We learn that rock of unprecedented richness has been struck in a mine at Mosquito gulch, owned by Messrs. Clark & Langdon, of Stockton. Our informant states that the quartz being extracted is fairly flecked with gold—absolutely permeated with the precious metal. We have heard no estimate of the probable yield per ton, but unquestionably it will be enormous.

REMARKABLE YIELD OF GOLD.—Again we have to chronicle a remarkable yield from the Champion quartz mine, at West Point, owned by Messrs. Haskins & Hadley. Forty-seven tons of ore taken from the Champion yielded up wards of \$5,000—an average of nearly \$110 per ton! For unsorted rock such a product is almost unprecedented, certainly not exceeded, if equaled, by any other mine in the State. It is a notable fact, one scarcely paralleled in the history of the quartz mining operations, that all the rock taken from the Champion, from the commencement of work upon the lead down to the present time, has paid over \$100 per ton—some of it as high as \$180. The bullion taken from the mine was melted and assayed by Mr. C. Schlund, of this place.

INYO.

ECLIPSE.—Inyo Independent, Jan. 15: After putting through 180 tons of average ore, the mill made a general clean-up a few days since, and we are very much pleased to be able to say, with quite satisfactory results. As was perfectly well known in advance the ore is low grade, and consequently the margin for profits per ton could not be large. As an actual fact this clean up shows a clear profit of \$2 per ton, which, small though it is as compared to some mines, is yet the most promising and important mining success, mill process, that has yet been made in this county, perhaps without a single exception, although ores have been worked, each ton showing nearly as much profit as these 180 combined. But this success indicates what can, and sooner or later will be done upon hundreds of low grade mines which otherwise would remain untouched. The Messrs. Endeys have, in this, demonstrated what judgment and economical management can do, and in doing it have accomplished more of real promise for Inyo mining interests than any others in this particular branch of mining that we know of. The working value of this ore was \$10 per ton. We do not know the percentage of loss, but as this was the first run and necessary appliances by no means full or completed, it was doubtless somewhat larger than it need be hereafter. Instead of twenty stamps thirty will be put to work, and with everything as intended it is quite likely the same class of ore will be made to yield about double the profit it did this first run.

GOON ORE.—Coso Mining News, Jan. 22: We mentioned last week that S. Lillien had shipped from his mine in Lookout district some ore to the Sunrise mill for reduction. Parties in from Lookout now inform us that the ore (2,100 pounds) worked in the mill \$839.41. The report is also corroborated by Dr. F. T. Bicknell and James Bruce, who came in from Panamint last Monday. We think this pretty good for silver mines, but we are not averse to publishing a better report if anybody can make as good a showing.

COSO ITEMS.—Defiance furnace has been running constantly since our last issue, without the least interruption; in fact there has not been a stoppage since the 22d of December last. The company has shipped since last Wednesday evening 1,360 bars of bullion, average weight 86 pounds to the bar. Shipments are now daily being made on the teams of the Cerro Gordo freighting company. Indeed, the Defiance is furnishing about all the freighting out that this company receives.

The Cervo furnace started up on Monday morning last, and they have succeeded in turning out quite a number of bars of bullion, still it is not working perfectly as yet.

LEE DISTRICT.—From G. M. Jordan, recorder for Lee district, and who came in last Tuesday, we learn that the wagon road from the Emigrant company's mines will be completed in the next three days, so that the machinery for their ten-stamp mill, which is now on the way, can be gotten down to the site prepared for it. The grading for the mill is all done, and as the frame and other timbers for same were made below and are being transported here with the machinery, there is no doubt but that the mill will be running in three or four weeks.

PANAMINT ITEMS.—From Dr. Bicknell, who came in from Panamint last Tuesday, we have the following items: The town itself, although yet a little dull, is gradually but surely improving. The S. V. M. & W. Co.'s mill is kept running night and day, and crushing custom ore when offered. On the Hemlock mine sinking is being vigorously prosecuted; they have attained a depth of about 400 feet, and the splendid, smooth foot-wall, of which we had occasion to speak so often in the Panamint News, and which we predicted would go to a great depth, is still seen at this depth, and an increased body of ore is found and of higher grade. The Sunrise mill is also running there

usual number of hours, and is doing quite well. Developments are still being made in their mines which justify the expectations of the owners at the commencement.

KERN.

GRANITE ITEMS.—Cor. Kern County Courier: Granite is the new postoffice which has been established but a short time, and is northeast from the county seat; distance, about twenty-five miles from said point. There have been several valuable discoveries made in this vicinity in the past, and also within the last six months, in the way of quartz lodes, containing gold and silver. The Loag Tom miniag district heads the list; here there are two very valuable gold lodes, the first known as the old Long Tom, owned at the present time by Col. Burdett, and the second by Wm. Youkum. These two mines have yielded something over two hundred thousand dollars in the past ten years, and are capable of doing even better at the present time, if properly worked. There is a ten-stamp mill on the Burnett mine, but owing to some case of litigation in regard to the mine and mill, work has been suspended for an indefinite length of time. About one mile north of Long Tom is situated the Eagle mine, owned by David Engle and J. Higgins. This mine is very rich in free gold. The ledge is from eight to fourteen inches in width, and yields from sixty to eighty dollars per ton, and pays well to assay. The owners have been at work for the past four months, assaying and opening up the mine. Five miles farther north and two miles northeast of Granite station we come to the Harbut mine, situated in Harbut mining district, and located in September, 1875, by C. M. Harbut, formerly of Yolo county, California, and present owner of Granite station. This mine bids fair at the present time to become one of the leading mines in Southern California, as it works from twenty-seven to thirty dollars per ton in gold by mill process. The main shaft is over eighty feet in depth from the surface. The ledge at that depth measures over seven feet in width and the ore is uniform as regards the pay per ton. This mine has every advantage as regards location, as there is an abundance of wood in this district, and a fine water power for mill purposes. Work will be resumed at the mine about the 20th of this month. I understand that the owners intend to sink to the depth of one hundred feet and then run an incline each way from the main shaft, preparatory to erecting a quartz mill.

PLACER.

CLEAN-UP.—Dutch Flat Forum, Jan. 22: We are in receipt of information that Messrs. Tebbetts & Chapman cleaned up one joy last week \$3,000 from twelve days' "run." The claim from which they have deducted the immense yield is located on the "Blue lead" at Little York. The process of reduction was somewhat tedious, it being necessary to run a powder-drift and sink a shaft in order to enable the operators to convulse the gravel by powder explosions.

SAN BENITO.

A NEW STRIKE.—Hollister Enterprise, Jan. 22: Our old friend, Bob Stayton, still continues to unearth new treasures in the Stayton quick-silver mine. A rich strike was made in the Yellow Jacket tunnel on Tuesday, which proves beyond cavil or doubt that the mine is not only rich but extensive. The vein in the old tunnel is eight feet wide—solid, first class metal—and for the purpose of testing its extent, a new tunnel was started on a perpendicular line several feet below, in which the lode was tapped as stated. Thirty wheelbarrows of high grade ore were thrown out by one blast. The mine has lately been sold to an English company for \$250,000, and evidences have been accumulating that they have got hold of a valuable property. It is now clear that this locality, which embraces the Stayton, Consolidated Wonder and other mines, is destined to be the second New Almaden of the State.

SAN BERNARDINO.

BEAR VALLEY MINES.—San Bernardino Argus, Jan. 15: Col. Chipley, the gentleman who bought in the Gold Mountain mining company's mill, situated at Bear valley, informed us before he left that it was his intention to organize a new company, put the mine under different management, and thoroughly prospect the claim. As the colonel is a man of energy and considerable influence in San Francisco, we prophesy that before two months more pass away, the sound of the hammer may again be heard at Bear valley. It seems to be generally conceded by those living at the mines and working in the employ of the company, that from first to last it has been a freeze-out game, inaugurated by Baldwin and the rest of his followers. Those poor people who had any stock in the mine were froze out in a barefaced manner; assessment after assessment was levied, and it would take a Philadelphia lawyer to find out where the money was expended.

Nevada.

WASHOE DISTRICT.

OPHIR.—Gold Hill News, Jan. 20: The machinery, both hoisting and pumping, is working finely. The repairs to the drifts on the lower levels are making excellent progress. Ore is now being regularly hoisted. The Nevada mill was started up yesterday morning. The work of opening an additional compartment at the north end of the shaft was also begun yesterday morning. Work was commenced both at

the top and bottom of the shaft. In a short time openings will probably be made at several intermediate points and the construction of the new compartment pushed to completion as rapidly as possible. The long gallery connecting the hoisting works with the east ore house is completed.

OVERMAN.—The north drift on the 1100-ft level is pushed steadily ahead, to connect with the south drift from the bottom of the winze on the same level. These drifts have only twelve or fifteen feet yet to run to complete the connection. This connection will ventilate the 1100-ft level and permit the cross-cutting of the ledge in that portion of the mine, if so desired. The pump station on the 700-ft level is being enlarged, so as to admit of a much heavier pump bob.

CHOLLAR POTOSI.—Daily yield fifty-five tons of ore. There is no change whatever in the ore-producing stations of the mine, and the decrease of the daily yield is caused alone by the inability of the teams to haul the ore to the mills as fast as it is extracted.

SILVER HILL.—A strong flow of water was encountered during the first part of the week in the east drift on the fourth station level. The water has checked again somewhat, and the pumps now have it under good control. This water is a strong evidence that the main ledge is not far away, and once the body is drained so that the development can proceed, some good results are looked for.

IMPERIAL-EMPIRE.—Owing to the bad roads and the inability of the teamsters to get the ore to the mills, but a small amount of the ore has been extracted during the past week. The dumps are still full, and only enough can be extracted to supply the space of the very small portion delivered at the mills.

CALEDONIA.—Sinking the main shaft is making good progress, notwithstanding a strong flow of water has been encountered in the bottom.

JULIA.—The drift on the 1600-ft level is in a distance of 56 ft, the face showing some very favorable prospects. The face of the main south drift, on the 1400-ft level, is almost entirely in fine quartz and ore.

CONS. VIRGINIA.—Daily yield, 550 tons of ore. The mills are kept steadily running on ore from the mine, and had it not been for the breakage of a spur wheel the California mill would ere this have added nearly 300 tons per day to the crushing capacity of the company. The ore breasts and stopes are all yielding splendidly, the north drift on the 1500-ft level of the California having reached the north line and connected with the Ophir. This drift is run its entire length in good ore. The north drift on the 1500-ft level is still pushed vigorously ahead to connect with winze No. 5, which is about 200 ft south of the Ophir line. The face of this drift is also in rich ore. The east drift on the 1500-ft level, running to connect with the O. & C. shaft on the 1350-ft level, is making good progress.

CALIFORNIA.—Sinking the O. & C. shaft is making excellent headway, the bottom being in good working ground. The main north drift on the 1500-ft level has penetrated to the Ophir line, the entire distance in good ore. The north drift on the 1550-ft level is steadily advancing, to connect with the winze sinking in cross-cut No. 5, the face of which is in rich ore.

LADY BRYAN.—Sinking the main shaft has made slow progress during the past week, owing to a steady and strong flow of water, which has been about all that the pumps could handle. The ore in the shaft continues of a good quality. The ore in the north drift on the 380-ft level is also holding out finely. The west cross-cut at the shaft, on the 380-ft level, is showing some fine ore. An average assay of all the ore bodies in the mine, made a few days since, gave \$47.50 per ton, a pretty good showing.

SIERRA NEVADA.—Sinking the new shaft goes steadily forward. The main south drift on the 1250-ft level is making good progress, the face in soft working ground. The main south drift on the 1000-ft level is also making fair progress, the rock in the face being a little harder than for some time past.

SILVER CITY.—Good practical work is being done in this mine, not only in the way of prospecting exploration, but ore extraction. The stopes and breasts above the adit level are showing an extensive amount of ore, and are being very systematically worked. The ore is selected with care, and a good large pile is accumulated on the dump.

SUCCOR.—The face of the main west drift on the 550-ft level is in hard blasting rock. The north cross-cut from this drift cut during the week a fine streak of white quartz 18 inches in thickness.

SAVAOE.—Cross-cutting and drifting on the 2000-ft level has been resumed. Repairing the drifts and winzes on the 2200-ft level is making steady headway, the damage to the drifts by the water being much greater than was at first supposed.

SULLIVAN.—South drift in 68 ft; vein formation hard. A cross-cut east has been started from it to go for the east wall and develop what can be found in that direction. Owing to the impracticable state of the road to the mine the requisite timbers for the shaft cannot be supplied at present without extra cost. For this reason the sinking of the shaft deeper will be deferred for a short time, and meantime explorations of the present level proceeded with. The vein matter is fully 180 ft between walls, and is of the regular white ore, Comstock character. It is the strongest, best and most promising fissure we have yet seen in that sec-

tion of the east range of the great Comstock belt.

DATTON.—The main shaft is now down 608 ft. A new set of station timbers has been put in at the 600-ft level, and the sinking is again proceeding. The main south drift on the 300-ft level is in a distance of 433 ft, and is making good progress toward the Kossuth north line.

KOSSUTH.—The main south drift on the 350-ft level is steadily advancing to the southward, the face in white quartz of a much softer and more favorable character than any yet encountered in that portion of the mine.

NORTH CONS. VIRGINIA.—Sinking the shaft for pump room below the 630-ft level, preparatory to opening a station and drifting for the ore vein, is nearly completed. The streaks of quartz in the bottom of the shaft are showing better.

LADY WASHINGTON.—Cattag out for a tank at the 530-ft station for the second plunger of the pump. The whole bottom is now in regular white Comstock vein matter of the most promising character, with streaks of quartz which give low assay.

PICTOU.—Total length of tunnel, 1,176 ft. The company now propose sinking a winze shortly in the front ledge passed through lately, which had five feet of clay wall and ten feet of ledge matter.

JUSTICE.—Material in face of south drift, at the 1000-ft level, somewhat softer. Face of drift at 800-ft level in porphyry, clay and quartz, giving low assay. Ore breasts and stopes at the 400 and 600 ft levels yielding as usual.

ORIGINAL GOLD HILL.—The raise above the south ore body is in excellent ore, and showing finely. The ore breasts and stopes are yielding as usual, about 20 tons daily. Hauling and milling will be resumed shortly. Splendid assays have been obtained during the past week.

SUREO TUNNEL.—Some very good streaks of low grade ore have been passed through at late, and the prospects for running into a bonanza are not bad by any means. An assay office has been erected near the mouth of the tunnel. Total length of tunnel last evening, 11,983 ft.

BEST AND BELCHER.—The mine will resume full operations on the lower levels as soon as the retimbering of the Gould & Curry shaft is completed and the water drained down to the 1700-ft level.

SOUTH COMSTOCK.—Cross-cut in 335 ft. It has passed through the hard streak entirely, and the whole face is in vein material of a very favorable character, with streaks of low grade ore.

NEW YORK CON.—The east and west prospecting drifts, on the 800-ft level, are both showing finely.

GOULD & CURRY.—Retimbering the main shaft is being pushed to completion with all the energy possible. The water has been drained down to the 1700-ft level.

COSMOPOLITAN.—Good prospecting work being done with some better ore in face of north drift.

UNION CONSOLIDATED.—The face of the south drift in the upper tunnel level is in a very favorable formation, and it is confidently expected that it will soon be the medium of some excellent developments.

EUROPA.—The north and south branches of the west drift on the 320-ft level are advancing steadily. The face of each is showing considerable quartz, and small seams of ore, mixed with porphyry.

CROWN POINT.—Daily yield, 425 tons of ore. There is little or no change in any of the ore producing sections of the mine.

BELOHER.—Daily yield, 450 tons of ore, keeping the mills all running up to their full capacity. The mine is looking well throughout, and the yield for the present month will fully equal that of December. Prospecting the 1600 ft level is going steadily forward, and the prospects have not been more encouraging for many months past than at the present.

YELLOW JACKET.—The north drift from the bottom of the north winze, on the 1940-ft level, is advancing in very favorable ground.

AMAZON AND GLASCOCK.—The station is opened at the 429-ft level and a drift started for the ledge. This drift is now in 30 ft, the face in ledge matter of a fine character. It cannot have very much farther to reach the principal ore vein. When the ledge is out some good ore developments may be looked for.

LEO.—A cross-cut west from the drift, at the bottom of the winze, is being run nearly opposite the east cross-cut. This drift is still in ledge material and ore. The ledge at this point has been opened a width of 40 ft without yet reaching the west wall.

HALE & NORROSS.—The work in this mine is mostly confined for the present to sinking the north and south winzes below the 2200-ft level.

GLOBE CONSOLIDATED.—The new ore discovery in the old upper works is looking finely, and strong hopes are entertained that the Globe will soon be a producing mine.

MINT.—The shaft has reached the 1000-ft level, at which point the sinking has been temporarily suspended for the purpose of putting a ladder-way and stations to the pump shaft.

BALTIMORE AND AMERICAN FLAT.—Pitting in the heavy pumps and columns, so as to be prepared in case a strong flow of water is encountered, is making good progress.

BULLION.—The combination drift northeast on the 2000-ft level is making good headway, the rock in the face being much softer than for some time past.

UTAH.—The new hoisting and pumping machinery will be started into full operation in three or four days more.

The California Mine.

We make the following extracts from the annual reports of the officers of the California mine, from the bonanza of which so much is expected this year.

The Superintendent says: During the past year the mine has been prosecuted as follows: On the 1300-ft level a drift has been run from our southern to our northern boundary, west of the ore vein, connecting with the openings of the Ophir mine. Cross-cut No. 1 has been run east 213 feet on the southern boundary to the ore vein. This drift has been extended north in the ore vein 100 feet, connecting with the winzes sunk in the ore body to the 1400-ft level. The ore found thus far on this (1300-ft) level has been of moderate quality, but that found in sinking the winze has been good from level to level.

On the 1400-ft level a drift has been run west of the ore vein the whole length of the mine, connecting with the Ophir mine on the north. Cross-cuts Nos. 1, 2 and 3 have also been extended from this drift across the ore vein. A lateral drift has also been run north from our southern boundary in the ore vein five hundred and sixty feet, and will soon be connected with the workings of the Ophir mine. A large amount of valuable ore is already developed on this level, but it is less regular than on the levels below.

On the 1500-ft level, a drift has been run from our southern to our northern boundary, west of the ore vein. Cross-cuts have been run from this drift one hundred feet apart, making six in all. The ore thus developed shows a width of from seventy-five to two hundred and eight feet. Cross-cuts Nos. 1 and 2 have crossed the ore vein. Cross-cuts Nos. 3, 4, 5 and 6 have not yet been extended across the ore vein, and its width is yet unknown. A lateral drift has been

Run in the Ore Vein

From the southern to the northern boundary, crossing all these cross-cuts and intercepting the openings of the Ophir mine. The ore passed through the entire length of this drift, except the northern 70 feet, has been of exceedingly high grade, assaying for weeks, during its construction, a thousand dollars (\$1,000) per ton. Three double winzes have been raised in the ore body from this level in cross-cuts Nos. 1, 2 and 3 to the 1400-ft level, all passing through ore of excellent quality. Four winzes have also been sunk from the lateral drift in cross-cuts Nos. 1, 2, 3 and 5 to the 1550-ft level, all of them passing through ore of high grade the whole distance. The developments on this level disclose a very large amount of exceedingly rich ore.

On the 1550-ft level the main drift has been extended north 400 feet from our southern boundary to cross-cut No. 5 in the ore body, passing through exceedingly rich ore, and the face of this drift is yet in ore of this quality. The main drift intersects all of the winzes sunk from the 1500-ft level. In cross-cut No. 1 the ore body has been developed to a width of 130 feet, and the ore vein is not yet crossed. Cross-cut No. 3 has been extended 65 feet, and neither east nor west walls have yet been reached. Cross-cut No. 5 has been developed 75 feet, and both ends of the drift are in high grade ore, as neither the east nor west walls have been reached. Between cross-cuts Nos. 2 and 3 a double winze has been sunk to the depth of 128 feet through ore of excellent quality the entire distance, and terminates in

Ore of the Same Richness.

Another winze has been sunk 320 feet south of our southern boundary to a depth of 147 feet. No cross-outs have been run from the bottom of these winzes. The developments made by these winzes prove the continuity at these lower depths of the same ore body which exists on the levels above, with an appreciation in the quality of the ore, which must be of great width. The sinking of these winzes has been temporarily discontinued on account of the increase of water and our limited means of hoisting. This difficulty will soon be obviated by the drift that is being run on the 1700-foot level of the Consolidated Virginia mine. This level is but partially explored. The ore found is of better quality than that on the levels above, and I have no doubt but that the ore body is of much greater width.

My efforts the past year have been to open the mine as thoroughly as possible on all the levels, and at the same time to take out as little ore as possible. The ore thus removed (5,123 4-5 tons,) has been daily hoisted, weighed, assayed and passed to our credit by the Consolidated Virginia mine, we not then having the mills to reduce it.

All of our levels are connected with the Consolidated Virginia mine on the south and with the Ophir mine on the north; also by the various winzes referred to, which thoroughly ventilate the mine and make it cool and pleasant. At the C. & C. shaft

Buildings Complete in Every Respect

Have been erected, and machinery for pumping and hoisting has been put in place and is now in full operation. In addition to the main building there is a blacksmith shop, a rope house, two large carpenter shops and one machine shop. The carpenter shops are supplied each with an engine and machinery—one of these shops being intended for the use of the Consolidated Virginia mine and the other for the California mine. The machine shop is fitted up with engine, lathes, tools, etc., one side of which is for the use of the Consolidated Virginia mine and the other side for the California

mine. For security against all fires the works are surrounded by hydrants, with a good supply of hose, and there is an ample supply of water under a very heavy pressure.

A large area of ground immediately surrounding the site of this shaft has been secured, having been purchased at a heavy outlay. This shaft is situated 1,040 feet east of the Consolidated Virginia shaft. It is now sunk with three compartments to the depth of 988 feet. The cost of this joint shaft to January 1st, 1875, was \$436,183.13. A drift is now being run east from the 1500-ft level of this mine, which will connect with the C. & C. shaft. It will reach that shaft and be

In Readiness for the Transportation of Ore

As soon as the shaft is sunk to that depth. Two hundred and eighty-eight feet remain to be sunk to reach this drift.

After this connection is made with the C. & C. shaft I feel safe in saying that our hoisting capacity will be 2,000 tons per day, and as to the supply of ore, we have now in sight in this mine a sufficient quantity to last for a long period.

The President's report is as follows: To the stockholders of the California mining company: In presenting my first annual report, I have only to call your attention to the development of this mine which has been going on for the past year almost uninterruptedly. The various drifts, cross-cuts and winzes necessary to future operations, have been opened in a systematic manner and with a view to ore extraction when the proper time comes for that work. The sinking of this extensive joint shaft has been steadily prosecuted until it has reached a depth of 988 feet, and a few months additional labor will find it penetrating

The Heart of the Ore Body

Already known, and furnishing ample facilities for raising ore in quantities sufficient for the payment of handsome dividends.

For the extent of the ore body and details of the work already done, I would respectfully refer you to the report of the superintendent accompanying, and for the receipts and disbursements of the fiscal year just closed to the report of the secretary.

In conclusion I may without hesitation congratulate you in the possession of

The Richest and Most Extensive Mine

Known at the present time, with the prospect of large returns in dividends for many years to come.

THE VIRTUE MINE—The *Bedrock Democrat* says: On last Saturday, Superintendent Hyde shipped bullion to the amount of \$8,139 from the Virtue mine to San Francisco. This was the result of twenty days' run with fifteen stamps. Since our last notice of this mine—some two months since—Superintendent Hyde has shipped \$47,000 in bullion to San Francisco from this mine. This mine, under the careful supervision of Mr. Hyde, is proving to be one of the most regular paying and profitable investments in this portion of Oregon, and will compare favorably with any mine in this portion of the Pacific coast. The mine is in good condition for working, and is being worked in an economical manner. There is a new shaft being started to strike the vein of ore in a new and more favorable place to take out rock than is accessible now. There are several more ledges near the Virtue mine which are proving themselves to be good. In the spring it is the intention of several practical miners to thoroughly prospect the country adjacent to the Virtue mine, and it is thought by those best acquainted with the configuration of the country, that the prospect for the finding of other good mines in this locality are as good as in any portion of the Pacific coast.

BANKS—The Senate has passed an important bill requiring every corporation doing a banking business in this State to keep in its office, in a place accessible to the public generally, and for the public use, a book containing a list of all stockholders in the corporation, and the number of shares of stock held by each; and that every such corporation must keep posted in its office for public use a notice signed by a majority of the directors showing the names of such directors and the number and value of the shares of stock held by each one of them. The law is made to apply to all existing banking corporations as well as those to be formed hereafter.

ORD DISTRICT—The *San Bernardino Times* says: Several gentlemen have recently arrived in San Bernardino en route for Ord mining district, where they have made purchase of some mines. They propose to prospect the mines of that district more fully, and if the indications will warrant them in so doing a stamp mill will be erected at once. Many who are acquainted with that district have great confidence in its mineral wealth, and believe that it will soon be developed. The ore is sufficiently rich to justify working, but wood and water are not accessible, and the rock will have to be hauled quite a distance.

ONE of the most promising new mining districts is located at Belleville, Esmeralda county, embracing several mines, the most productive of which is the Northern Belle, which yielded \$351,000 in eleven months of last year, and disbursed \$350,000 in dividends.

THE Staton quicksilver mine, adjoining the Consolidated Wonder, in the town of Hollister, has been sold for \$250,000.

Ancient Shoes.

Recent discoveries have shown that the modern form of shoe is the same which was in use in Upper Egypt ages and ages ago. The pictures found in tombs in Upper Egypt represent people wearing shoes exactly like ours. It is, nevertheless, certain that the form of these shoes were unknown generally in the East, for chroniclers mention that everybody in the East, in Sparta and at Athens, went barefooted. Sandals came very slowly into use, for they were extremely inconvenient, and Athenians commonly preferred to go barefooted. In Rome, too, even senators long went barefooted. Cato, of Utica, never walked otherwise than barefooted. Shoes were so rare in France in the ninth century, that they were among the presents sovereigns made to each other; for example, Solomon III, sovereign of Brittany, charged the ambassador he sent to Rome to present the Pope in his name a golden statue, a mule, saddled and bridled, thirty ebrials, thirty pieces of cloth, thirty deer skins and thirty pairs of shoes for his servants. The caprices of fashion soon began to mold the form of shoes, and the strangest forms were adopted. Mediaeval chronicles are full of invectives against the shoes *à la poulaine*, which were in great vogue in the twelfth century. The toe of these shoes was pointed upward like the prow (*poulaine*) of a galley; the heel was armed with a spur. A royal ordinance of 1367 interdicted these shoes in France. They nevertheless were still worn by some persons at the court of Francis I. Shoes with excessively broad toes drove these shoes out of fashion. In 1422 hoots made their first appearance. Moxeray mentions that Charles VII was so poor on his accession to the throne that no shoemaker would sell him a pair of hoots on credit. The forms of hoots and shoes have changed repeatedly and annually changed.

Artesian Fire at Lakeside.

Mr. C. W. Clark informs us that he has "struck it" in his well down on the lake. At the depth of 140 feet there rose from his well a volume of gas which ignited upon the touch of a lighted match, and burned with great fury for an hour or two, until partially shut off by the flow of sand, when it was extinguished by closing up the pipe. Subsequently one of Mr. Clark's sons, noticing the continual flow of gas, which showed itself at the orifice of the pipe in little spangles, like beated air, dropped a match into it and looked down to see the effect. He not only "saw it," but felt it and smelt it, too. A shoot of flame, accompanied by a roaring sound, resulting from the expanded gas, threw him several feet from the well, burning his face, whiskers, and eyebrows, and (perhaps,) frightened him some. The well pipes was soon at red heat, the water in the well boiling furiously, the gas struggling through it and twenty feet of sand at the bottom. More pipe has been ordered and a further investigation of the earth's bowels will be made. Mr. Clark has a good thing on his well, if the gas continues flowing steadily in the same volume, as it can be lead into his house for heating purposes, and it is quite possible that it might be utilized for both light and power. Mr. Clark has now got a salt mine and a gas generator on his place, but is going for more. The Lakeside country may amount to something besides a stock range, if those sandlappers don't let it alone.—*Visalia Delta*.

Butte City Mines.

A correspondent at Butte City (Montana) writes to the *Helena Independent* as follows: This lively camp, which your paper and the Territorial press generally have noted, is not a new one by any means. The best inhabitants speak of this as the third waking up, and draw favorable omen from that circumstance.

Professor Hodge, who accomplished so much for Unionville, in your county, in establishing the National works, first visited and resided at a place called Roosevelt, near Butte, bought ledges and set a large number of men at work developing them. His report, a copy of which is in my possession, of the camp, is very full and fully sustains the most of what is called an extravagant one at the present day.

Though a great number of the lodes have changed their names by relocation, yet they prove the Professor's words true. It may be asked if so impressed why did he desert it and Montana? After spending a large sum of money in their development, he located a site for his works, but before he could make a record of it another party had anticipated him and secured the property. The Professor became disgusted, discharged his men and left Butte to sleep. But the camp is now alive.

In my recent visit there I found at least 500 men. Buildings are going up in every direction. Six stores, five saloons, one brewery, two shoemaker and two butcher shops, three blacksmith and four carpenter shops, and two quartz mills of ten stamps each, constitute the business portion of the camp.

THE Union and San Felipe mining companies, of Cerro Gordo, have settled their difficulty and have incorporated with a capital of \$10,000,000. G. M. Fisher, of Oakland, the prominent contestant against Belshaw, becomes one of the directors. The result will be a vast increase in the bullion production.

Rapid Bridge Building.

Our readers have already been informed of this wonderfully short time occupied by Thoe. A. Scott, president of the Pennsylvania railroad, in rebuilding the bridge over the Schuylkill, at Philadelphia, which was recently destroyed by fire. The bridge formed a portion of one of the main thoroughfares leading into that city, and every day's delay of its completion was a serious loss to its business interests. The time ordinarily occupied for the construction of such works would have menaced the success of the work upon the Centennial building, and even the great exhibition itself. Hence the urgent necessity for extraordinary celerity in its reconstruction. In this, both the city and nation's dilemma, Col. Scott stepped in, and rendered the city and country a service which will stand as a monument to his skill and efficiency, perhaps until another centennial anniversary shall roll round.

Years had been required to build the old bridge, and now the necessity required, if within the bounds of possibility, that only a few days should be allowed for its reconstruction. So great was the emergency that the contract was signed before the embers of the old structure had scarcely ceased to burn. How he executed his trust was a mystery until the *Iron Age*, of New York, rose and explained as follows: "Mr. Thomas A. Scott, president of the Pennsylvania railroad, dropped in at the mayor's office and said: 'See here, I'll build you a strong bridge, with double the capacity of the old one. It shall cost \$65,000, \$10,000 less than the insurance on the burned bridge; I'll sell it to the city for cost price exactly; I'll return every cent less than \$55,000 that it costs, and I'll guarantee to have it done by the first of January.'

"When the city authorities had recovered breath this bold proposition was accepted. Mr. Scott had anticipated their acceptance by telegraphing all over the lumber country of Pennsylvania as soon as he made his proposition, ordering the bridge timber to be immediately cut and loaded upon cars to await orders. The instant the contract was signed he sent dispatches ordering that these cars be attached to lightning express trains and whirled toward Philadelphia. Before Mr. Scott's proposition had been officially received everything was ready. About 150 men stood with saws, hammers and spikes in their hands on the banks of the river at the site of the old bridge, waiting for the ordinance to pass, ready to strike the first blow the moment the signal was given.

"It was toward evening on the 5th of December when the contract was signed, and work was begun without an instant's delay and kept up all that night. By daylight and by torches and calcium lights, Sundays and week days, in fair weather and storm, without an hour's intermission, the bridge building was carried on under the direction of Mr. William J. Lockhard, division superintendent of the railroad. Three hours less than twenty-one days from the time the mayor signed the ordinance, or seven days ahead of time, the bridge was finished and formally opened to travel. The men who had been engaged upon it were then treated to a Christmas dinner at the railroad depot in West Philadelphia, and will be permitted to take a well earned rest during the holidays. The bridge is a Howe truss, well constructed of white pine, with flooring of oak. The structure is 540 feet long, the two end spans being each 162 feet and the center span 216 feet in length. The truss is twenty-five feet high in the clear and twenty-eight feet from out to out. The width of the bridge is forty-eight feet, including the sidewalk, which is ten feet wide."

A SINGULAR accident occurred at the Vivian mine, near Silver City, recently, by which two men were quite severely injured. A bucket of water which had been frozen over was placed on the forge to be thawed out, and while one of the men was in the act of lifting it off with a pair of tongs it exploded with great violence, the bucket flying into innumerable pieces, and injuring Samuel Tangie, the blacksmith at the mine, and George F. Oxtan, a miner, very severely. A piece of the bucket, which was made of sheet iron, struck Tangie on the shin, making a ragged wound about an inch in length and tearing the periosteum off the bone. The chances are good for him to lose his leg. Oxtan's principal injury is on his leg below the knee. Both men have several minor ones, which under other circumstances would be considered pretty bad. No cause for the accident, except that some miner had thawed out a giant or herculean powder cartridge in the water during the night, can be given.

A "TRACK FLANGING CAR" has just been turned out of the Central Pacific railroad shops at Sacramento, the object of which is to clear from the track the snow, which frequently packs so tightly beside the rails as to throw off a train. This contrivance consists of a "flat" provided with an axle, upon which are two little steel ploughs, kept down by a spring when in service and thrown out of place when an immovable obstacle is met, only to resume its place when the obstruction has been passed. This car run ahead of a locomotive is expected to do the work of 50 or 100 men.

A FACTORY for making a newly invented explosive material, compared to which giant powder is supposed to be a weakling, is soon to be started at Nevada City.

Useful Information.

Rising in the World.

Experience continually contradicts the notion that a poor young man cannot rise. If we look over the list of rich men we find that nearly all of them began life with little or nothing. To any person familiar with the millionaires of the United States a score of examples will occur. On the other hand the sons of rich men, who began life with the capital which so many poor young men covet, frequently die beggars. It would probably not be going too far to say that a large majority of such moneyed individuals either fail outright or gradually eat up the capital with which they commenced their career.

And the reason is plain. Brought up in expensive habits, they spend entirely too much. Educated with high notions of personal importance, they will not, as they phrase it, stoop to hard work. It is astonishing, therefore, that they are passed in the race of life by others with less capital originally, but more energy, thrift, and industry? For these virtues, after all, are worth more than money. They make money, in fact. Nay, after it is made, they enable the possessor to keep it, which most rich men pronounce to be more difficult than the making. The young man who begins life with a resolution always to lay by part of his income is sure, even without extraordinary ability, gradually to acquire a sufficiency, especially as habits of economy, which the resolution renders necessary, will make that a competence for him which would be quite insufficient for an extravagant person. It is really what we save, more than what we make, which leads us to fortune. He who enlarges his expenses as fast as his earnings increase must always be poor, no matter what his abilities. And content may be had on comparatively little. It is not in luxurious living that men find real happiness.—*Scientific American*.

SHARPENING EDGE TOOLS.—The grindstone should not be less than two feet or eighteen inches in diameter. It should revolve to meet the tool (except when grinding very fine or delicate tools). In grinding a chisel for instance, it should be held firmly on the stone without moving, until a slight wire edge is felt on the other side, which may easily be told by passing the thumb over the opposite side to that which is being ground. When this is felt, turn the chisel over and proceed in the same manner until the wire edge is transferred to the opposite side. It should now be whetted on an oilstone, taking care not to hold the tool too upright, or it will do more harm than good. It should be whetted first on one side, then on the other until the wire edge appears off; now take a piece of deal, free from grit, and draw the edge of the tool across the grain; if it has been properly whetted the wire edge will now be properly removed. Goggles are only ground on their convex surfaces. They should be ground until a wire edge can be felt by passing the finger along the inside of the gouge. This can be removed with the oilstone and deal. While grinding goggles they should be constantly turned from right to left, or the edge will be full of notches. Tools for soft wood should have a long bevel edge to make them cut keen. About a half-inch bevel is best.—*Am. Cabinet Maker*.

A "DOZEN" IN THE POTTERY TRADE.—As the derivation from the French *douzaine* implies, it is generally presumed that a dozen implies twelve things, but in the Staffordshire potteries and in the earthenware trade (queensware in Philadelphia, crockery in other places) a dozen to this day represents that number of any special article which can be offered at a fixed price. That is, the price is fixed and the number to the dozen varies. For instance, the pitchers, which are called "jugs" in the trade, are sold as 2, 3, 4, 6, 9, 12, 18, 24, 30, 36 pieces to each dozen, the price for a dozen being constant. The ordinary pitcher, holding a quart, is a twelve, or twelve to the dozen, while a pint pitcher is twenty-four to the dozen, and is so called when dealing in that size. Few of the articles of the trade are sold in dozens of twelve, plates being almost the only ones, and some of them are sold at sixty to the dozen. Besides these curiosities in figures, the potters have peculiar names—muffins, twiflers, etc.—that make up a trade language of themselves. The quantities for dozens are, we think, yet preserved in the wholesale, or package trade.

A NEW PAPER PROCESS.—It is said that, by a new process recently patented by Eastern parties, it is proposed to manufacture wrapping papers out of green grass or hay. The inventor claims that if grass is used, he can make good paper without cooking the material, and the natural color of such paper will be dark brown—suitable for hardware trade, etc. By this process he claims a saving of five dollars per ton, in fuel alone. If hay is used, it will have to be cooked, and we infer the cost will be about the same as for straw paper.

SOMETHING NEW IN PIANO CONSTRUCTION.—A German tailor at Des Moines has invented a curious sort of piano, the hammer of which strikes bells instead of strings. There are in this piano sixty-six bells, varying from two inches to thirteen inches in diameter, all so adjusted that each bell shall give its perfect tone in response to the touch of the performer's hand on the key-board.

CONDENSED BEER—HOW MADE.—Mr. Lockwood describes, in the *Journal of the Society of Arts*, his patent aloid or condensed beer. Beer is taken at its best condition; its alcohol is separated and saved by a method of gentle distillation in *vacuo*, and the residue is condensed in a vacuum pan, like milk; when finished, it is enclosed in hermetically sealed packages, the alcohol first being added to it again, and acting as a preservative. The fermentation, which was present in the beer when it was taken, is suspended by the heating, and the condensed beer remains sound in this condition, apparently for any length of time, as some exists that has now been kept for nearly two years. When re-made by adding water, it is not wort, but real beer, having all its flavor and alcoholic strength, and lacking only effervescence, which can be quickly imparted by reviving the suspended fermentation for a short time in order to develop sufficient carbonic acid gas to give it the required briskness; or it is fit to drink immediately, if charged with carbonic acid gas, like watered beer.

UTILIZING CINDER PILES.—Quite a business has sprung up at various points in the country in the working of the cinder piles of blast furnaces. For several years iron made in a cupola from cinder piles has been in use in Pittsburgh, and we believe other localities, and is known as Buckeye iron. It is very close, but gives good results in the puddling furnace, especially in mixtures with red short iron. Iron is being made on this plan at Cleveland, at Indianapolis, at Chicago and Cincinnati, and we understand in various other places. There is a vast amount of such waste in all our iron smelting districts; many thousands of tons have been used to fill up bogs and hollows, and to make roads, but the amount yet within easy reach is still immense.

CALMING THE WAVES.—The belief of sailors that rain calms the sea can be confirmed to some extent by pouring water from a watering-pot into a glass jar filled with water, upon which rests a layer of water colored by some substance. This superficial layer will be seen to send rings downward; each ring being set in motion by a drop of the water falling from the watering-pot, and which occupies its center. As in a storm it is only the superficial layer of water which is in motion, the sea would necessarily be calmed by any cause which forced this surface layer of agitated liquid down into that which is at rest. But may not another cause be the retardation of the wind by passing through a thick bank of raindrops?

GOOD HEALTH.

Responsibility of Housekeepers.

(Written for the Press by LORRAINE.)

Health is a matter universally held of the first importance, for without it people are unfit for most of the duties of life, unable to enjoy its pleasures, and usually experience more or less mental and physical suffering.

It has been decided, not only by the most eminent of the medical profession, but by the majority of enlightened people everywhere, that a man's food, that is, what he eats and how he eats it, has more to do with the state of his health than any one other ordinary condition.

If this be the case, it follows that a rather heavy responsibility rests upon the shoulders of the housekeeper, particularly if she also fulfills the office of cook.

Now, the majority of housekeepers are good, well meaning persons, but what miserable work they often make with the preparation of food. If they study the subject at all, it is to make their dishes present a good appearance, and taste well, giving very little consideration to the wholesomeness or unwholesomeness of the ingredients.

People who seem to exercise a fair amount of common sense with regard to other matters, show themselves miserably deficient on the subject of hygiene, as relating to food and the proper time to take it.

One woman forbids her children eating fruit at breakfast time, because they are delicate; and allows them to have coffee, hot doughnuts, and fried pork.

Another housekeeper in cooking beans parboils them in three waters, carefully pouring away each water to get the "poison" out, and cooks all her fruit in a tin pan, allowing it to remain in the pan two or three days, thereby absorbing a quantity of positive metallic poison from the action of the acid on the lead contained in the tin.

Not one housekeeper in twenty enjoys perfect health, yet none of them will admit being troubled with dyspepsia, or even the slightest indigestion.

Mrs. Smith is afflicted with sick-headache two or three times a week, always after eating roast pork or boiled cabbage; but of course those dishes have nothing to do with it, it is constitutional, or is caused by the cold or by the heat.

Mrs. Brown is subject to colds, dizziness, bad breath, no appetite in the morning, and a multitude of aches and pains; but none of these are attributable to the pastry, black pepper, greasy gravy, hot white bread and biscuit that she indulges in every day. O, no! it is the air, or the location of the house, or her having to do housework, or not being able to ride often.

And so she goes on, until too unwell to eat anything at all for a day or two, not even a mouthful of pork and beans, or a bite of mince pie; then she takes a dose of some patent medicine, or puts a plaster on her back, and meditates on the mysteries of Providence.

Providence has little to do with the poor health of American women, the blame rests mostly with themselves.

The health of the whole family is to a great extent in the hands of the mistress of the house. She usually buys the food, and if she does not buy it, she prepares it for the table, or oversees its preparation, and can easily spoil the biscuit or the pan-cakes, or corn bread with over doses of soda, and fill the vegetables and meat with black pepper and pork fat, making them fit for nobody to eat, not even a savage. The other inmates of the house are obliged to eat what is put on the table, or take the alternative of starving, and the result is the general prevalence of dyspepsia.

Heads of families, and particularly housekeepers, should be better informed with regard to the properties of different kinds of food, and the best modes of preparing them, and when that time comes we shall see an improvement in the general health of the people.

Santa Cruz, January, 1876.

Hydrophobia After Three Years.

The Lancaster (Penn.) *Examiner* has an account of the death of Samuel Hance, a black smith, twenty-three years old, in Chester county, that State, after three days' suffering. It says: "He was bitten by a dog in Delaware three years ago while working at smithing. On Thursday Mr. Hance complained of feeling unwell and during the night was taken with convulsions, the fear of water being very marked, the first symptoms of the affection being the difficulty in swallowing water. From Thursday until the time of his death he was frequently seized with the most violent convulsions, which morphine and chloroform were perfectly powerless to check, the slightest disturbing influence throwing him into a spasm—as fanning, a current of air, or a fly lighting upon him. Before going into what proved his last convulsion he requested the attendant to tie him, as he was afraid of hurting some one, being a very powerful man. So the doctor had him tied and held during the convulsion, and he died soon after the convulsion was over. During this convulsion he struggled terribly and snapped his teeth several times, the striking of the teeth being plainly heard. The sufferer was attended by Drs. Horner, Thornton and the Drs. Hoskins, of Chester county. Ever since Mr. Hance was bitten, which was upon the finger, and which was not at all sore during his attack, he had no morbid fear of hydrophobia, being of a rather phlegmatic temperament than a nervous one, and had during the three years been of good health and entirely temperate in his habits. He was married, and leaves a wife and young infant child."

Eyesight of Engine Drivers.

A communication has recently appeared in the English papers addressed by Mr. Watson, surgeon of the Great Northern hospital (Eng.), which is calculated to set railway travelers on the *qui vive* in regard to the possibilities of danger in such traveling from a heretofore unsuspected quarter. This correspondent is actually "convinced" that it is a matter of some uncertainty whether the drivers in charge of trains are not often suffering from an affection of the eyesight. Mr. Watson's far from re-assuring conclusions upon this important subject have been derived from professional attendance upon the late driver of one of the fastest express trains. The condition of this man's power of vision was such as to preclude him from seeing at a distance beyond twenty feet objects which should have been visible at 200 feet.

It is satisfactory to learn that this particular driver, in the face of probable visitations of snow and fog, had the honesty to relinquish work which he could not have performed but with great risk to the public. It is far from clear, however, that every driver afflicted with amaurosis would manifest so laudable an appreciation of the moral code as to resign lucrative employment out of consideration for the public safety. Mr. Watson's communication will doubtless excite many a nervous railway passenger to entertain fresh fears upon the subject of accidents, tho' the possibility of an engine driver being unable to perceive a danger signal 200 feet distant until within six yards of it being anything but a comfortable reflection. The appointment of an oculist for periodical inspections of engine drivers' eyes, in the interest of the public, is a remote but not altogether an impossible contingency.

SEA AIR AND MOUNTAIN AIR.—The difference between the action of sea air and that of mountain air on the human system has been recently explained by Professor Beneke, of Marburg, whose experiments show that bodies part with their heat a great deal more rapidly on the sea shore than among the mountains. Near the ocean the processes of change in the body are accelerated; and sea air is beneficial for persons who are overworked, but whose digestive organs are good. A mountain atmosphere, on the other hand, renders the bodily movements easier by reason of the diminished pressure, and increases the activity of respiration. Professor Beneke thinks that irritable, nervous persons will find themselves better in mountainous districts.

DOMESTIC ECONOMY.

Cooking Potatoes.

"She cannot even cook potatoes," is an expression I have heard more than once. And it is true of altogether too many attempting to keep house. They being such a "stand by" as "something to eat in the house," it certainly is worth while to know how to prepare, cook and serve them the year through.

Growing potatoes should be cooked the same day they are dug; though they will keep a few days if the crevices between them are kept filled with moist earth. The quickest way to get the skin off is to put them in a pail or other deep vessel with bits of brick or stone, and water enough to just cover all, and stirred briskly with a rough stick. The fire must be attended to before the potatoes are put over it. If any fresh fuel is to be added, then is the time, for it is so apt to check the heat and so spoil the potatoes. They must not stop cooking until taken off. They are best steamed, provided the steamer fits half way into the kettle. If the steamer fits just on top, it is hard to get sufficient heat to make them good. They can be put into boiling water and boiled, if the water is all poured off as soon as the potatoes are done, and the kettle put back on the stove with the cover off and allowed to dry. As soon as done, either from boiling or steaming, they should be partially pried open with a fork, so the steam from the inside can escape, then placed in a dish, and hot gravy poured over them. If the vegetable dishes have covers, get one especially for potatoes without a cover, else leave off what you have, for they must not be allowed to steam themselves after they are cooked. If there is no other nice gravy, one can be made of a lump of butter the size of an egg, heated, and a teacup of milk. This will be sufficient gravy for a quart dish of new potatoes; none other should be served with the gravy over them.

After the potatoes are done growing, the skin is tight on them, and they should be washed and steamed, or boiled, like the growing ones, but with the skin uncut. If they are good, and cooked quick, they will burst as soon as done. By the first of January, and all the time thereafter, they are best mashed before serving. If peeled for this before cooking, a very thin peeling only should be taken off, for the best of the potato is just next to the skin, and if boiled after being peeled, this best part is lost in the water. They should be steamed if possible. When done they must be peeled, and mashed quickly, leaving no lumps. As each one is peeled, lay it in a tin pail, or other deep vessel with perpendicular sides for mashing, and break or pry open, but not cut, each one for the escape of steam, while the rest are being peeled. Then if nothing better can be had, and not much better is needed, a fork should be used to beat them against the sides of the pail. Beat briskly until no lumps can be seen. Add salt and rich cream. Turn out in the dish in flakes, leaving the surface to arrange itself; and they are ready for serving. They will be found far more palatable after this treatment than when mashed with a wooden maul, and butter added, then smothered down on the dish, stopping up all the vents for steam to escape. They become waxy after this last treatment, like butter after being worked with the hand in warm weather.

Cold potatoes to be warmed over for breakfast must be sliced thin, and put into hot fat, without a cover over them and salted. They will fry a nice brown in this way, or if not wanted brown, cream can be added and allowed to boil up once.—*Maine Farmer*.

WELSH RABBIT.—In answer to a correspondent we gave a recipe for making Welsh rabbit some few weeks since. Here is another: Olivia writes: "The following recipe for Welsh rabbit I can guarantee as an old English one. It can best be made in a chafing dish, except the indispensable toast, which must be done, of course, before hot coals: Take a good slice of rather new cheese, say one-half pound, cut it into thin chips, do the same with one-eighth of pound of Gruyere cheese. Have your chafing-dish hot, with one-eighth of a pound of fresh butter melted, and stir in the cheese, stirring hard. Add a salt-spoonful of dry mustard, a claret glass full of good ale, or the same quantity of port wine. Pour it hot over the toast."

IMPROVING SPOILED BUTTER.—An excellent process intended to improve spoiled butter was patented in 1859, and therefore expires in about a year hence. It is founded on the fact that the butter in barrels spoils first and mostly from the outside; the hoops and staves are therefore removed from the spoiled butter, it is surrounded with a bag, and the whole buried in charcoal contained in a large barrel or any other suitable receptacle. The well known and wonderful absorbent power of the charcoal for odors removes all strong flavor from the butter, and soon gives it the appearance of a fresh article, saleable in the market at a price far in advance of that which rancid butter brings.

To clean a brown porcelain kettle, boil peeled potatoes in it. The porcelain will be rendered nearly as white as when new.

MINING SCIENTIFIC PRESS

W. B. EWING..... SENIOR EDITOR.

DEWEY & CO., Publishers.

A. T. DEWEY, ORO. R. STROGO
W. B. EWING, JNO. L. BOONER

Office, No. 224 Sansome St., S. E. Corner
of California St., San Francisco.

Subscription and Advertising Rates:

ADVERTISING RATES.—1 week, 1 month, 3 months, 1 year.			
Per line.....	.25	.90	\$2.00
One-half inch.....	1.00	3.00	7.50
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THE ORIGINAL ARTICLES in this paper are mostly set in solid type, giving in our columns one-third more reading than is contained in ordinary leaded matter.

San Francisco:

Saturday Morning, Jan. 29, 1876.

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PACIFIC COAST COLLECTION LAWS.—This is the title of a new book by J. H. Jellet, of this city. It is, as the title indicates, a summary of the laws of California, Nevada, Oregon, Washington Territory, Idaho, Montana, Utah, Wyoming, Arizona and British Columbia and of the United States in relation to bankruptcy; also the jurisdiction of U. S. courts, with the names of reliable attorneys in the principal cities and towns throughout the Pacific coast. Mr. Jellet has, for upwards of six years, been in charge of the law and collection department of the mercantile agency of R. G. Dun & Co., and the compiling of this work has suggested itself to him as important to bankers, merchants and manufacturers having business transactions in the Pacific States and Territories, including British Columbia. It has also been prepared with a view to aid attorneys and notaries in matters arising outside of their own State or Territory. A concise statement of the laws relating to the collection of debts is given, in which the compiler has been assisted by various practicing attorneys in the different States and Territories of the coast. The subject matter is divided up in appropriate chapters under the different States and Territories, and a copious index makes the work handy for reference.

THE BRUCKNER FURNACE.—We learn that the Blue Jacket mine has just started two of Bruckner's revolving roasting cylinders, and obtain an average of over 90 per cent. of the assayed value of the ore. Two others are now being erected at Phillipsburg, Montana, and will soon be in operation. The present indication seems to be that the Bruckner roasting cylinder will come into general use. Information concerning these cylinders can be had by addressing Lane & Bodley, Cincinnati, O.

Working Gold Ores.

Great interest is naturally manifested on this coast in anything pertaining to improvements on metallurgical processes, and more especially on those which cheapen the present modes of working. For the past few years very few new processes have been brought before the public, and fewer still have been adopted. But it is not very many years since the whole country was flooded with "new process sharps," each one of whom had a way of working ores which was superior to all others. Naturally many people were taken in with these representations, and the consequence is that now the mining community looks very shyly at anything which savors of change in metallurgical operations.

At the same time they acknowledge that the processes in vogue are not up to what they should be, and look eagerly for some means which will enable them to work their ores up to a better percentage of assay value, and which shall, at the same time, not be too expensive. Of course those conversant with mining affairs on this coast know very well that it is not always the fault of the process in vogue that the ores do not yield as expected. As long as miners are content with from 60 to 85 per cent. of assay value, just so long will millmen return them from 60 to 85 per cent.—and no more. In many instances the tailings are a source of greater profit than the original milling, and no one knows this fact better than the average mill owner. Of late years these circumstances have changed for the better, but still there is great room for improvement.

It has come to be an acknowledged fact, however, that quartz mining in this State has not been generally profitable. There are a number of quartz mines now being worked which yield large revenues to their owners, but where there is one in this condition there are a hundred which do not pay. The consequence of this is that it is difficult to enlist the services of capital to develop gold mining properties. Plenty of money is forthcoming to work silver mines in Nevada and elsewhere, but California gold mines are at a discount.

Many of our gold mines have ledges of sufficient width and amount of sufficient value to be worked at a profit in other countries, but here they lie idle, waiting for a metallurgical millennium, and meantime the gold product of the State falls off from year to year, and the main dependence is placed on the hydraulic mines.

What has been wanted, and what has been really necessary, is some process which would give the miner all the gold in the ore, and not let from twenty-five to fifty per cent. of it go to waste with the tailings. A difference of \$1 or \$2 on a ton will make all the difference between working or not working a mine, and yet sums so small, are considered of little moment in the tailings. The miners have found out by bitter experience that they must be slow, sure and economical to make the quartz mines pay. There must be no leaks of a dollar a ton here, or two dollars a ton there, but every cent must be accounted for. Still, with the utmost care, our present methods of milling and working gold ore have not been satisfactory, a fact we are forced to acknowledge with reluctance. Within the past few months the California quartz miners have begun to hope that the Fryer process would solve the problem, and they are now waiting somewhat impatiently to learn the details of the process. We give in another column a description of the furnace used by Mr. Fryer, and will soon publish a description of the whole matter, so that those interested can judge for themselves. For the present we must all be contented with the assertions of those who have seen the process and its results, viz., "that it is a success."

A Centennial Exhibition in San Francisco.

On Thursday evening last the Board of Managers of the Mechanics' Institute held a meeting to consider the advisability of holding an exhibition this year. The question was fully discussed at the meeting of the managers, the result of the discussion being the adoption of the following:

WHEREAS, A request has been submitted to this Board, signed by a large number of our best citizens, that an industrial exhibition be held under the auspices of the Mechanics' Institute and the management of the Board, during the present year, and with a view to celebrate the one hundredth anniversary of our nation's birth, in view of the reasons therewith presented, and the general desire to have an exhibition in this city,

Resolved, That an industrial exhibition be held in this city on the 8th of August next, with the usual ceremonies.

The Fair, as will be seen by the foregoing, is announced to open August 8th, and while no time has been fixed for closing, it is conceded that it will remain open until the middle of October. An effort will be made to secure a display of the products and a representation of the industries of the States of California, Oregon, Nevada and the Territories of the Pacific coast.

Some time next week a meeting of the Trustees will be held to reorganize as the Board of the Eleventh Industrial Exhibition.

A massive iron suspension bridge will be constructed over the Coyote river, east of San Jose, the coming summer.

The Belcher.

The annual meeting of the Belcher mining company was held on Tuesday last, when the election of officers took place. The mine paid a dividend last month for the first time in a year, but as the prospects of the mine are rapidly improving, it is hoped that the Belcher will soon again take its place among the dividend paying companies. The Belcher has the best records of any mine on the Comstock lode, and consequently any on the coast, although after this month the Consolidated Virginia will have exceeded it in aggregate of dividends. The Belcher has paid out in dividends the magnificent sum of \$15,085,200, equal to \$136 per share. Its total assessments only aggregate \$660,400 or \$6.35 per share, and it has not levied an assessment since April, 1871. Crown Point up to this month has paid out a total of \$11,588,000 in dividends or \$115 per share, with \$673,370 in assessments; and Consolidated Virginia has paid up to this month \$14,040,000 in dividends or \$130 per share, with \$411,200 in assessments. By comparing these figures it will be seen that the Belcher has paid out the greatest aggregate sum and the greatest sum per share in dividends of any mine on the famous Comstock. Although it paid only \$312,000 as a dividend in 1875 it levied no assessments, and work has been vigorously prosecuted all the time.

The receipts for the fiscal year were: From hullion, \$3,383,873.55; cash on hand, January 1st, 1875, \$242,079.15. The principal items of disbursements were: From dividend No. 34, \$312,000; the aggregate expenses were \$2,846,717.65; cash on hand, \$329,759.45, and a time certificate in the Bank of California of \$148,952.61. There were 34,117 tons of ore worked during the year, which yielded at the rate of \$28.43 per ton. The non-arrival of the Superintendent's report in time to be read at the meeting, and the death of the Secretary (H. C. Kibbe) lately, will account for the absence of the President's report and the detailed items of receipts and expenditures. The time certificate mentioned above represents the indebtedness of the Bank of California at the time of its suspension, and like all other large creditors, rather than have the institution go into bankruptcy, it gave it an extension of time to pay its indebtedness. The mine, as will be seen by our Mining Summary, continues to yield well, especially the 1500-foot level, the ore from which runs very high in gold.

Coral Reefs and Islands.

This was the subject of Professor Joseph Le Conte's second lecture (the first of which we published last week) before the School of Mechanic Arts, delivered last Saturday. The growth of coral, he said, which has been continued from the time the bottom of the Pacific began to subside until the present time, goes beyond the present geological epoch. One foot of growth per century, corresponding with one foot of subsidence, for a depth of 10,000 feet, would be just 1,000,000 years. Dead corals at a depth of 250 feet would represent a period of from 12,000 to 15,000 years. Below that depth there is good reason to believe that the coral goes beyond the present geological epoch, and is prolonged throughout the whole tertiary period. Corals continue to live and to build at depths not exceeding from 60 to 100 feet in open sea, and this shows that the same causes which operated to form land in past times are still operating. Limestone, which forms so large a portion of the earth's strata, he believed to be chiefly the product of organic growth; and he was of opinion that the whole western side of the American continent, from the Mississippi westward, has been upheaved higher and higher as the correlative of the downsinking of the Pacific bed. This upheaval has proceeded to the extent of 8,000 feet along the plateau from the Mississippi westward, without taking into consideration the mountain chains, and as the general surface of the country rose higher and higher, those wonderful canons, eroded by such rivers as the Colorado, were formed gradually. The lecturer then entered upon the principal theme of his lecture—the coral formation of the coast of Florida. The southern point of the Florida peninsula he examined with Agassiz in 1850 and 1851. Before that date the whole of Florida was supposed by geologists to belong to the tertiary age, but the investigation demonstrated that Florida is a recent coral formation, belonging to the present geological epoch, or at all events is subsequent to the last, and that the formation is still in progress. The southern part of Florida is composed wholly of limestone, twelve or fifteen feet above sea level. In the interior of the southernmost part are the Everglades—a swampy ground, dotted with hummocks, not more than two feet above the surface of the sea. Outside the coast line of the mainland runs the line of the Florida Keys, 150 miles in length, and terminating in the Tortugas—none of which islands are more than fifteen feet high. The water between the Keys and the mainland is very shallow. In the chain of the Keys are a number of islets called Mangroves, from being dotted with trees of that name. These are formed of mud, and are only a foot or two above the water. Lying outside of the Keys, which are of limestone, is the living barrier of

coral reef, between the great semi-circular sweep of which and the island of Cuba runs the swift current of the Gulf stream. The whole of lower Florida, from the land north of the Everglades, a distance of 300 miles, has been demonstrated to be a coral formation. The Everglade swamps, lying between the limestone on the north and the limestone on the coast, have simply been formed by the mangroves, whose spreading roots, intercepting the sediment, rapidly advance from the sea shore and form land; and the shoal water between the Keys and the coast is the counterpart of the Everglades before the mangroves formed the land. In time the deep channel between the Keys and the outer reef will fill up, and the outer reef will become the southern boundary of Florida. Mr. Le Conte did not think the coral formation will proceed beyond the present outer reef, because the Gulf stream runs too strong to deposit the sediment necessary as a formation for coral building in deep water. Between this reef and Cuba the water is almost unbottomable, and corals do not live at a greater depth than 100 feet.

Notices of Recent Patents.

Among the patents recently obtained through DEWEY & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of mention:

ANIMAL EXTERMINATOR.—Valentine Schmidt, S. F. (an interest assigned to H. P. Wakelee). The object of this invention is to so prepare grain which has been saturated or coated with a poisonous compound for the purpose of exterminating ground squirrels and other animals, that it will become a permanent and fixed poison, capable of being transported from place to place, keep a good length of time without becoming spoiled through must, decomposition or otherwise, and always be ready for use. Heretofore when poisoned grain has been used for exterminating squirrels and other animals in the field, it was not saturated or coated with the poisonous compound until it was needed for use, and then when still moist or damp it was distributed in the field. This invention consists in fixing the poisons coating or covering upon the grain in a permanent manner, so that it can be packed in cases, tins or packages, and sold as an article of commerce and always ready for use.

WASHING MACHINE.—Orville V. Roe, Chico, Butte county, Cal. This improvement in washing machines consists in securing inside of a tub two corrugated rollers, one above another, the upper one of which can be rotated by means of a crank, so that the clothes to be washed can be run through between the two rollers and thus cleaned. The exact method of corrugating upper and lower rollers is immaterial, but the inventor prefers to work alternate corrugations and narrow, plain spaces, so that lintons coming under the upper roller cannot catch so as to break, and the upper roller has large grooves so that the buttons can turn either way. This provides a cheap and effective washing machine. The clothes may be either passed through between the rollers, or they may be inserted between them and held, so as to rub any soiled spots.

OPERATING ELEVATOR AND OTHER VALVES.—Philip Hinkle, S. F. This is a novel device, which may be employed to operate elevator and other valves when it is necessary to open one and close another valve at the same time. It consists of a slotted segment formed on different centers, and the stems of the valves are moved by this slot. The outer edge of the segment is provided with teeth, and a pinion mounted upon the axle of an operating rope pulley serves to turn this segment in either direction as the case may require. By this peculiar construction the inventor is able to open the valves with a direct motion and control the supply of water with accuracy.

COMBINED PUMP CONDENSER AND HEATER.—J. A. T. Overend, San Francisco. The object of this invention is to provide an improved means of condensing the exhaust steam from engines, and at the same time heating such additional water as may be needed to condense this steam to a point high enough to allow it to be economically fed to the boiler by means of a novel pump, which is combined in the same device.

BRIDLE BIT.—Hansen H. Soren, San Francisco. This inventor patents an improvement in bridle bits, which consists in constructing the bit in two parts, so that it can be easily separated and removed from the mouth of the animal without detaching any portion of the bridle. This provides a simple means of allowing a horse to be fed without the usual removal of the bridle.

CATTLE WASH.—Albert Sievers, S. F. This is an improved wash or cleaning fluid for cleaning horses, cattle and sheep, and for destroying insects which breed upon cattle and sheep. The wash is made of substances which will not injure wool and its only effect on the skin of the animal is of a curative character.

A BILL has been introduced in the Legislature to regulate the price and quality of gas in San Francisco.

The Raymond & Ely Mine.

The Raymond & Ely mine is the representative mine of Ely district, and just at present the fate of the district seems to hang upon whether ore is found below the "water level" in that mine or not. The mine ceased paying dividends in September, 1873, since which time, although work has been steadily prosecuted, it has not paid. The Raymond & Ely gave Pioche the prominence it at one time held, and has a very good record. It was opened in 1870, and in 1871 yielded in bullion, \$1,361,000, paying from that amount as dividends, \$615,000, which was forty-five per cent. of the yield. In 1872 the bullion yield was increased to \$3,694,000, of which fifty-five per cent., or \$2,070,000 was paid out in dividends. In 1873 the mine produced 2,365,352, but only paid out \$390,000 in dividends. In that year the mine was involved in very expensive litigation, paying out for law expenses, \$289,849, and for purchase of property and claims, \$288,173.

The mine is well supplied with excellent hoisting works, capable of working to a depth of 2,500 feet. It owns several mills at Bullionville and has complete works in the shape of engine house, boiler house, foundry, machine shop, ore house, blacksmith and carpenter shops, etc. The first series of ore deposits was exhausted in 1873, and the work of exploration has failed to develop any new bodies. Work has been continued with the hope of discovering new deposits corresponding in character with the rich ores of former years.

The annual meeting of the company was held this week, and the President in his report says the aspect of the mine presents the adoption of either of the following alternatives:

"From the present aspect of the mine, unless favored in the way of striking other bodies of ore than those now being extracted, we cannot reasonably hope the bullion yield to be enough to meet current expenses.

"To reduce expenditures would be to relax the vigor that has been pursued in the explorations of the larger extent of the virgin ground of the company, which not to do, would in the end prove unwise economy.

"There are but two courses to adopt, either cease doing dead work (or prospecting), or push forward the general system of exploration that has been pursued until it be well established that there are no more profitable mineral deposits in the mine. If the resources of the mine are inadequate to pay current expenses, assessments are the only alternative to meet the deficits between the receipts and disbursements of the company."

This being the representative mine of its district, we make the following extracts from the very full annual report of the superintendent. It says:

During the year just closed there has been extracted from the mine 13,544 476-2000 tons of ore, the greater portion of which was taken from the western portion of the company's ground. Previous to the commencement of the year the eastern portion of the company's ground had been prospected to the water level and proved comparatively barren along the water line; and the new and powerful pumping machinery which was erected in the early part of the year has proved inadequate to the requirements of deep workings. Consequently but little progress has been made in exploring the mine below the water level. Several ineffectual attempts have been made to continue the main shaft downward, but the pumps not having sufficient capacity to remove the water the work was discontinued, and for the past four months the pump has been running up to its full capacity and thus far has failed to remove the water so that sinking could be resumed. [We see by the Pioche Record, however, that since this report was printed the water has been drained to the bottom and prospecting commenced again.—EDS. PRESS.] The most productive portion of that ground has been between the eighth and ninth levels. To the west of winze No. 2 there has been a continuous body of good milling ore, extending 400 feet in length, varying from twelve inches to seven feet in width. This ore shoot terminates about twenty feet to the west of winze No. 4, on the eighth level, at which point a cross-head makes in, dipping to the west on an angle of 45 degrees, which cuts the vein entirely off, not even leaving a trace behind. The west drift on the 8th level was continued on through the cross-head and has penetrated the formation to the west of that point, a distance of 218 feet, and at present the face of this drift shows a mixture of talc and limestone, principally the latter, which is the mountain rock. This drift is still being pushed ahead (it has now a total length of 1,921 feet) in hopes that the quartzite may rise to the west of the formation now being penetrated by this drift.

A prospect drift was run south from the main west drift on the 8th level, at a point 1,132 feet west of the main shaft, and carried ahead a distance of 153 feet, at which point a stratum of ore eight inches in width was disclosed, which was followed to the west a distance of twenty-three feet, at which point a cross-head made in the face of the drift, which cut the vein entirely off.

A winze was started and carried down on the ore streak a distance of 125 feet to the 9th level;

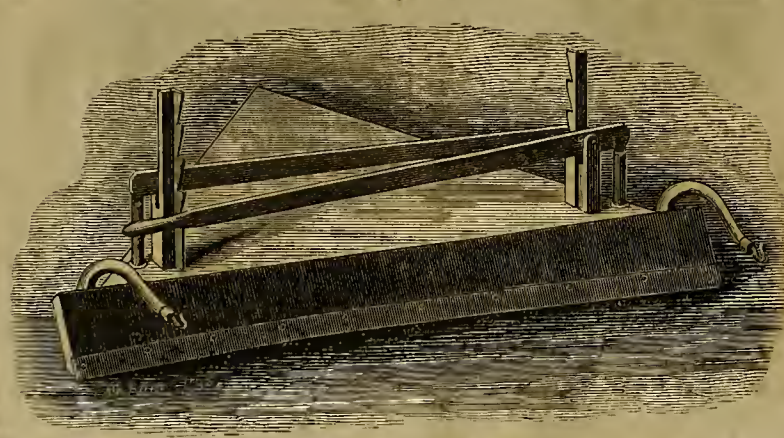
the entire distance sunk showed a continuous streak of ore varying from eight to ten inches in width.

The west drift on the 9th level was continued up to and beyond the same cross head found on the 9th level, where the same formation was encountered as shown on the level above.

The cross-cut was also run south from the west drift on the 9th level, to intersect the south vein, a distance of 154 feet, at which point a connection was made with the winze sunk from 8th level. At the point of connection the eastern limit of the south vein is defined by a cross-head which made in at the bottom of the winze on the 9th level, and to the east of this cross-head no trace of the fissure has as yet been found. To the west of this cross-head the vein is followed westward a distance of 115 feet, at which point another cross head makes in, which cuts the fissure off entirely; still the drift has continued on through the cross-head, and to the west of that point 60 feet, where the quartzite formation becomes very regular and the throw of the vein always being to the south, running westward when displaced by these cross heads. We are at present engaged in running a cross-cut south from the end of this drift, which has now a length of 40 feet, for the purpose of determining whether the south vein continues to the west of this cross-cut or dies out at that point.

Several winzes have been sunk from the 9th to the 10th level, along the line of the ledge. These explorations show the vein to be strong and well defined, but comparatively barren; but the trend of the ore-shoots being to the west, gives reason to hope that ore will be found in paying quantities to the west of this point.

The west drift on the 10th level has been continued ahead until it now shows a length of 1553 feet. The formation being penetrated in hard quartzite, with only a seam to point out the line of the fissure; but as the No. 3 winze, being carried down from the 9th level, is coming down but a short distance ahead of the face



HAW'S ROAD SCRAPER.

of this drift, and is showing a strong, well defined vein, with some promising indications of ore, we may expect to meet with a favorable change in the face of this drift very shortly.

A cross-cut was run south from the west drift on the 10th level, at a point 1,270 feet west of the main shaft, and carried ahead 44 feet, at which point we found a seam or separation in the quartzite, which proved to be the continuation of the south vein downward. A drift was carried to the west on this seam a distance of 73 feet. The entire distance showed the vein to be very small, and, at intervals along the line of the drift, a frosting of ore was found adhering to the walls of the fissure.

A winze was started at a point 1,057 feet west of main shaft on 10th level and carried down a distance of 86 feet, at which point the influx of water was so great that it could not be removed with the appliances we had at our command. Hence, work was discontinued, and at present there is 12 feet of water in the bottom of the winze.

The west drift on the 10th level has now a length of 1,104 feet. The face of drift shows a mixture of talc and quartzite, with occasionally some small spots of very base ore. We were compelled to discontinue work in the face of this drift a few weeks ago, in consequence of not having sufficient air to prosecute the work in connection with the raise which we are at present engaged in running no to connect with the bottom of winze sunk from 10th level. This raise has now a length of 78 feet, which leaves a distance of 28 feet to raise before the connection will be made with the bottom of winze. This connection, when completed, will furnish a good circulation of air, when the work on the 11th level can be prosecuted to advantage.

We are at present engaged in running an up-raise from west drift on eighth level, at a point 1,520 feet west of the main shaft, which has now a length of eighty feet. This raise is furnishing some very fine ore; but, so far, the ore streak is very limited in extent; but as the raise is being carried up two hundred feet west of the Page & Panaca workings, and in a country entirely unexplored, it is reasonable to believe that our efforts in this locality will be rewarded by the development of some paying bodies of ore.

We are also engaged in extending the main drift on the fourth level westward. At the point of commencement the fissure is strong

and well defined, and occasionally shows some promising indications of ore. The only bad feature that presents itself at this point is the hard, smooth foot-wall, which is regarded in this locality as an unfavorable indication of ore; but the ground being very changeable, this unfavorable feature may soon be displaced by more promising indications.

In consequence of the pumps not having sufficient capacity to remove the water the Lighter shaft has only been extended downward 61 feet during the year, making its total depth 1,275 feet. The pump is working very satisfactorily, and is gradually exhausting the water, and I believe we will be able to resume sinking in a few days. [It has been resumed.]

The Burke and Creole mines, belonging to the company, have been allowed to remain idle during the greater portion of the year. After a thorough examination of these mines I decided to apportion them off on the different levels, and let contracts to individual prospectors, allowing them to extract ore from the old abandoned levels of these mines at their own expense and pay the company 40 per cent. of all the ores extracted, and the other 60 per cent. to be worked at the company's mill, if desired; but so far, no revenue has been derived from this source, as the explorations made by these parties on the different levels have proved unprofitable and disclosed but very little ore.

The company's thirty-stamp mill at Bullionville is in good condition, and is being run up to its full capacity. The twenty-stamp mill has been idle the greater portion of the past year, having only run two months on tailings in the early part of the year.

Ores Extracted.

There were 13,714 1-5 tons of ore extracted, and there remains upon the mine and mill dumps 813 4-5 tons. 12,592 3/4 tons milled produced in bullion \$659,471.11, being an average yield of \$52.60 per ton. The ore was worked up to a percentage of 63 8-10. 13,681 tons tailings yielded \$78,793.31, which is at the rate of \$5.76 per ton. The superintendent esti-

mates the value of stores at the mine and mill at \$63,854.83.

The Secretary makes the following report:

Disbursements.

For balances of last fiscal report, since liquidated—superintendent's drafts, \$56,153.51; Union iron works, \$19,902.81; Bank of California, \$49,226.06; total, \$125,282.38. For mine properties—settlement of adverse claims, \$23,094.50; law expenses, \$49,277.55; total, \$72,372.05. For construction and improvements at mine—cost of works at Pioche for current year, \$31,610.24. For mining—extracting ores, \$241,447.65; dead work, \$200,898.77; total, \$502,346.42. For milling—reduction of ores, \$268,674.23. For mine pump construction—cost of works during current year, \$54,826.71. For miscellaneous expenditures—discount on bullion for current year, \$73,229.28; State of Nevada bullion taxes, \$6,293.31; State of Nevada property taxes, \$6,091.16; insurance premium on mill property, \$5,600; telegrams to and from San Francisco, \$420.85; freight on bullion, \$491.20; general office expenses, \$10,483.83; interest, \$8,522.42; total, \$110,432.05. For Nevada Central railroad, \$34,385.50. Total disbursements for the term, \$1,199,930.48. Unliquidated balances—Magnet mining company, \$10,677.05; Hermes mining company, \$144; D. M. Tyrrell, general superintendent, (current balance), \$579.46; bullion in transit, \$58,339.65; cash balance in bank, \$39,775.03; total, \$109,515.19. Grand total, \$1,309,445.67.

Receipts

From balances of last fiscal report, since liquidated—bullion in transit, \$22,196.02; inventory of supplies at mine, \$5,665.25; inventory of supplies at mill, \$58,532.42; total, \$86,393.69. From bullion yield of company's mine—product of ores for current year, as per exhibit No. 2, \$738,305.97; from ore sales, \$5,943.79; from sales of mine supplies, \$1,903.84; from sales of mill supplies, \$1,013.66; from Pioche Phoenix mining company, \$2,500; from machine shop and foundry, \$3,157.47; from assessments, \$330,204.30; total receipts for the term, \$1,169,422.72. Unliquidated balance—superintendent's drafts on San Francisco office, outstanding, \$140,022.05. Grand total, \$1,309,445.67.

The past five years the company has produced \$8,806,286.75 in bullion, and out of this amount disbursed \$5,000,926.28 in dividends. The last one paid was September, 1873.

Haw's Road Scraper.

We illustrate on this page a handy, simple road scraper, invented by R. A. Haw, of Eureka, Humboldt county, California. It is intended principally for work on roads, but may be used for leveling off uneven ground, scraping side hills and work of like character. It has been in use in various parts of Humboldt county for a year or more past, and the inventor has numerous testimonials from road overseers, farmers and others as to its efficiency.

The machine, as will be seen by the engraving, is made of wood, and weighs about 400 pounds. The scraper portion has a width of twelve feet, is set at an incline from the frame work and is shod with steel. The main weight of the machine rests on a pair of castor wheels to which are attached levers to raise or depress the scraper as circumstances require. The portion in the rear of the scraper itself is V-shaped and made of strong timber.

The machine is drawn by two teams. From the lower inside corners of the scraper a curved beam passes up and over the top to the front at each corner, and to these beams the teams are attached. The driver of one team rides on the scraper to operate the levers to suit the varying requirements of the ground. The angle at which the scraper is to be drawn is regulated entirely by the teams. If it is to be drawn at an angle so as to throw the dirt to one side, one team is allowed up so that the other draws the corner ahead a little and then both teams are driven at the same speed. The lower edge of the scraper is curved slightly so as to give a rounded surface to the road.

The machine is perfectly adapted for the purposes for which it is designed. It will fill up depressions and take down elevations or lumps on the road, giving a uniform surface. It is much lighter than ordinary implements of the kind, and requires few horses to do the work. Four horses are needed to work it properly. The machine is so constructed as to work on the edge of a ditch or gulch, and drag the dirt from the edge to the middle of the road, without throwing any of it into the ditch. With it also, work can be done close up to a bank or cliff without the team being in the way. On the edge of a ditch, the teams are in no danger, as they draw the scraper obliquely after them, so that it scrapes even over the edge and draws the dirt into the road.

The raising and depressing levers are arranged by means of notches, so as to keep the scraper in any position required with reference to height. The inventor shows us many testimonials as to the efficiency of the machine, and informs us that all who have used it are perfectly satisfied with its operations and give it high praise. It is essentially a labor-saving machine—doing away with the use of pick and shovel in repairing roads; and, at the same time, doing the work quicker, cheaper and better. Those desiring further information can address the inventor, care of Dewey & Co., 224 Sansome street.

MINING SALES.—The Kansas and Nebraska gravel claims, belonging to Evans & Davis, near French Corral, have been sold to a party of Chinamen for \$14,000. The well known San Bruno mine at Mosquito gulch, Calaveras county, owned by Messrs. Hoerchner, Seigler & Key, has been sold to N. Sackrider, Esq., of San Francisco. Rumor says that \$10,000 was the price paid. The San Bruno has for a number of years been classed among the best paying mines of the county. The *Inyo Independent* says: J. J. Dolan, who six months ago bonded the Minnenta and several other mines in Lookout district, on Tuesday last consummated the purchase and went below, with the four parties from whom he purchased, to see Mr. Lent and others for the purpose of having all the necessary papers drawn and the money, \$30,000, paid over. Mr. Dolan informs us that active operations will be commenced immediately for the development of this splendid property.

MINING PATENTS.—Patents have recently been issued for the following mines: California, Amador county, Christian Harney and others; Gray Eagle, quartz mines, J. G. Adan and others; New London, quartz mine, Martin Nester and others; Volunteer company, quartz mine, El Dorado county, John Summerfield and others; Willow, placer, E. G. Telor; Ohio tunnel company, placer, Bonney, Mooney and others; Gray Eagle, quartz mine, W. K. Grimes; Eureka, quartz mine, Nevada county; N. Bloomfield gravel mining company, placer, Charles F. Bates and others; Local Option, placer, Flacior and Nevada counties, B. H. Bartlett; No. 1 lode, Eureka county, Nevada; K. K. Consolidated mining company (Surplus, Porter and Brown lodes), J. F. Rooney and others; Fourth of July lode, White Pine county, B. F. Brooks and others; Sunbeam and Emerald Isle lodes, Utah.

The boring of artesian wells is going on all over the southern section of Los Angeles county, the artesian belt seeming to range from Downey to the county line, and water occurring at a depth of from sixty to three hundred feet.

There is so much water in the lower levels of the K. K. mine near Eureka that pumping machinery is an absolute necessity, and about \$50,000 will soon be laid out for that purpose.

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OIL Cakes and MEAL.Highest price paid for Flax Seed and Castor Beans de
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Established 1856.

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Tanned Manila Rope; Hay Rope; Whale Line, etc., etc.

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BRASS and BELL FOUNDRY
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BRASS CASTINGS of all kinds,
WATER GATES, GAS GATES,
FIRE HYDRANTS,
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bet. First and Fremont, San Francisco. Orders from
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Material furnished to order. Wood and Ivory Turn-
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Balusters. 26v8-8m-bp

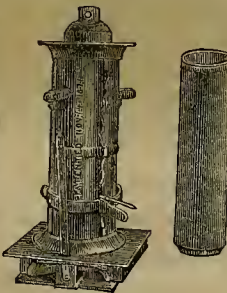
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ramento and
Montgom-
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DRAINS

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In any part of the
State, and

Work Warranted

E. T. MENOMY
Proprietor.At a Stated Term of the Circuit Court
of the United States of America of the Ninth Judi-
cial Circuit in and for the District of California, held
at the court room in the city and county of San Fran-
cisco, on Thursday, the 30th day of September, in the
year of our Lord one thousand eight hundred and sev-
enty-five. Present—The Honorable Lorenzo Sawyer,
Judge.Nicholas Selbert, complainant, vs. Wm. T. Garratt,
defendant—In equity.

DECREE.

This cause came in to be heard at the February
Term, A. D. 1875, of this Court and was argued by
counsel and thereupon upon consideration thereof, it
was ordered, adjudged and decreed, as follows, viz:
That defendant, William T. Garratt, was not the first
or original inventor, or discoverer of the improvement
or discovery claimed by him, in and by those certain
reissued letters patent of the United States, number
five thousand three hundred and twenty-eight (No.
5328), for an alleged new and useful improvement in
lubricators, issued to said defendant, William T. Gar-
ratt, on the 18th day of March, A. D. 1873, and is not
entitled to a patent therefor, and that said reissued
letters patent, number five thousand three hundred
and twenty-eight (No. 5328) are declared void and the
same are hereby vacated and set aside by reason of their
interference with those certain letters patent of the
United States, number one hundred and eleven thou-
sand eight hundred and eighty-one (No. 111,881) for a
new and useful improvement in lubricators, issued to
complainant, Nicholas Selbert, on the fourteenth (14th)
day of February, A. D. 1871.It was also further ordered, adjudged and decreed
that complainant do have and recover of and from de-
fendant his costs and expenses to be taxed herein.
(Signed) LORENZO SAWYER,
Circuit Judge.The above decree has reference to "Selbert's Enreka
Lubricator" for oiling the valves and cylinders of
steam engines.It has a glass gauge and condensing pipe, or reser-
voir, with a regulating feed valve, and works as fol-
lows: As the water of condensation is admitted, under
the oil, just so fast the oil passes out at the top through
a pipe into the steam pipe to oil the valves and
cylinder.Parties who infringe or purchase the infringed
lubricators, will be held strictly responsible.
N. SEIBERT, Patentee,
125 First Street, S. F.

CHAS. H. PHELPS,

ATTORNEY AT LAW,

306 PINE ST., N. W. Cor. Sansome, SAN FRANCISCO

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projecting and constructing mining and milling ma-
chinery, and especially machinery for mechanical ore
concentration, is open for re-engagement, and would
prefer the task of constructing works for mechanical
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milling line for successful operation. Apply to
Messrs. DEWEY & CO., of this office, for reference.

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per ounce Troy at different degrees of fineness, and val-
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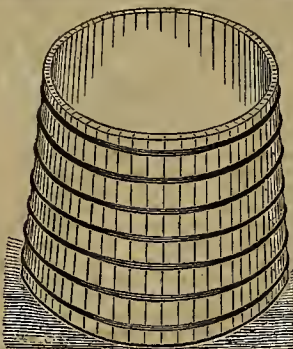
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24v26-tf

No. Certificate.	No. Shares.	Amount.	No. Certificate.	No. Shares.	Amount.	No. Certificate.	No. Shares.	Amount.	No. Certificate.	No. Shares.	Amount.
Shaw, Prosper P Trustee.....	14	100	100	Hoy, J.....	20	100	100	00	W L Duncan, Trustee.....	273	60
Shaw, Prosper P Trustee.....	15	100	100	Hoy, J.....	21	100	100	00	W L Duncan, Trustee.....	274	10
Shaw, Prosper P Trustee.....	16	100	100	Howa, Henry A.....	32	100	100	00	W L Duncan, Trustee.....	275	20
Shaw, Prosper P Trustee.....	17	100	100	Howa, Henry A.....	36	100	100	00	M Moritz, Trustee.....	276	10
Shaw, Prosper P Trustee.....	18	100	100	Howa, Henry A.....	37	100	100	00	M Moritz, Trustee.....	277	10
Shaw, Prosper P Trustee.....	19	100	100	Howa, Henry A.....	38	100	100	00	M Moritz, Trustee.....	278	10
Shaw, Prosper P Trustee.....	20	100	100	Howa, Henry A.....	39	100	100	00	M Moritz, Trustee.....	279	10
Shaw, Prosper P Trustee.....	21	100	100	Howa, Henry A.....	413	40	40	00	M Moritz, Trustee.....	280	10
Shaw, Prosper P Trustee.....	22	100	100	Howa, Henry A.....	414	135	135	00	M Moritz, Trustee.....	281	25
Shaw, Prosper P Trustee.....	23	100	100	Howe, Henry.....	135	135	135	00	M Moritz, Trustee.....	282	25
Shaw, Prosper P Trustee.....	24	100	100	Holmes, Philip A.....	88	100	100	00	M Moritz, Trustee.....	283	50
Shaw, Prosper P Trustee.....	25	100	100	Hoy, E. P.....	437	20	20	00	M Moritz, Trustee.....	284	50
Shaw, Prosper P Trustee.....	26	100	100	Hoy, E. P.....	438	20	20	00	M Moritz, Trustee.....	285	10
Shaw, Prosper P Trustee.....	27	100	100	Hubbard, Geo W.....	178	100	100	00	M Moritz, Trustee.....	286	10
Shaw, Prosper P Trustee.....	28	100	100	Iselin & Co., A.....	unissued	1145	1145	00	M Moritz, Trustee.....	287	10
Shaw, Prosper P Trustee.....	29	100	100	Joslyn, Back & Co., A.....	unissued	200	200	00	M Moritz, Trustee.....	288	10
Shaw, Prosper P Trustee.....	30	100	100	Joslyn, Back & Co., A.....	unissued	200	200	00	M Moritz, Trustee.....	289	10
Shaw, Prosper P Trustee.....	31	100	100	Kellogg, Chas.....	unissued	14	14	00	M Moritz, Trustee.....	290	10
Shaw, Prosper P Trustee.....	32	100	100	Lackwood, R C.....	unissued	256	256	00	M Moritz, Trustee.....	291	10
Shaw, Prosper P Trustee.....	33	100	100	Leutz, Jesse.....	unissued	28	28	00	M Moritz, Trustee.....	292	10
Shaw, Prosper P Trustee.....	34	100	100	Litchfield, Edwin C.....	unissued	405	405	00	M Moritz, Trustee.....	293	10
Shaw, Prosper P Trustee.....	35	100	100	Lauran, Chas D.....	unissued	161	161	00	M Moritz, Trustee.....	294	10
Shaw, Prosper P Trustee.....	36	100	100	Leo, Arnold.....	unissued	200	200	00	M Moritz, Trustee.....	295	10
Shaw, Prosper P Trustee.....	37	100	100	Loring, Jos B.....	unissued	135	135	00	M Moritz, Trustee.....	296	10
Shaw, Prosper P Trustee.....	38	100	100	Lewis, M. M.....	unissued	100	100	00	M Moritz, Trustee.....	297	10
Shaw, Prosper P Trustee.....	39	100	100	Massanand, Robt L.....	unissued	13	13	00	M Moritz, Trustee.....	298	10
Shaw, Prosper P Trustee.....	40	100	100	Miller, Alex.....	unissued	48	48	00	M Moritz, Trustee.....	299	10
Shaw, Prosper P Trustee.....	41	100	100	Marshall, Robt.....	unissued	402	32	00	M Moritz, Trustee.....	300	10
Shaw, Prosper P Trustee.....	42	100	100	M. rore & Co, E. S.....	unissued	214	214	00	M Moritz, Trustee.....	301	10
Shaw, Prosper P Trustee.....	43	100	100	Monroe & Co, E. S.....	unissued	30	100	00	M Moritz, Trustee.....	302	10
Shaw, Prosper P Trustee.....	44	100	100	M. rore & Co, E. S.....	unissued	409	15	00	M Moritz, Trustee.....	303	10
Shaw, Prosper P Trustee.....	45	100	100	M. rore & Co, E. S.....	unissued	11	15	00	M Moritz, Trustee.....	304	10
Shaw, Prosper P Trustee.....	46	100	100	Meyers, Hiram W.....	unissued	100	100	00	M Moritz, Trustee.....	305	10
Shaw, Prosper P Trustee.....	47	100	100	Morgan, Geo D.....	unissued	507	507	00	M Moritz, Trustee.....	306	10
Shaw, Prosper P Trustee.....	48	100	100	MacKwall, A V.....	unissued	94	100	00	M Moritz, Trustee.....	307	10
Shaw, Prosper P Trustee.....	49	100	100	Oppebuehler, Ed L.....	unissued	70	70	00	M Moritz, Trustee.....	308	10
Shaw, Prosper P Trustee.....	50	100	100	Olcott, Horatio L.....	unissued	207	100	00	M Moritz, Trustee.....	309	10
Shaw, Prosper P Trustee.....	51	100	100	Olcott, Horatio L.....	unissued	208	100	00	M Moritz, Trustee.....	310	10
Shaw, Prosper P Trustee.....	52	100	100	Olcott, Horatio L.....	unissued	209	100	00	M Moritz, Trustee.....	311	10
Shaw, Prosper P Trustee.....	53	100	100	Olcott, Horatio L.....	unissued	210	100	00	M Moritz, Trustee.....	312	10
Shaw, Prosper P Trustee.....	54	100	100	Olcott, Horatio L.....	unissued	211	100	00	M Moritz, Trustee.....	313	10
Shaw, Prosper P Trustee.....	55	100	100	Olcott, Horatio L.....	unissued	212	100	00	M Moritz, Trustee.....	314	10
Shaw, Prosper P Trustee.....	56	100	100	Olcott, Horatio L.....	unissued	214	100	00	M Moritz, Trustee.....	315	10
Shaw, Prosper P Trustee.....	57	100	100	Olcott, Horatio L.....	unissued	450	63	00	M Moritz, Trustee.....	316	10
Shaw, Prosper P Trustee.....	58	100	100	Paton, Thomas.....	unissued	232	232	00	M Moritz, Trustee.....	317	10
Shaw, Prosper P Trustee.....	59	100	100	Patten, Geo D Jr.....	unissued	20	20	00	M Moritz, Trustee.....	318	10
Shaw, Prosper P Trustee.....	60	100	100	Paxon, W.....	unissued	100	100	00	M Moritz, Trustee.....	319	10
Shaw, Prosper P Trustee.....	61	100	100	Rose, W W.....	unissued	40	100	00	M Moritz, Trustee.....	320	10
Shaw, Prosper P Trustee.....	62	100	100	Rose, W W.....	unissued	41	100	00	M Moritz, Trustee.....	321	10
Shaw, Prosper P Trustee.....	63	100	100	Rose, W W.....	unissued	42	100	00	M Moritz, Trustee.....	322	10
Shaw, Prosper P Trustee.....	64	100	100	Rose, W W.....	unissued	43	100	00	M Moritz, Trustee.....	323	10
Shaw, Prosper P Trustee.....	65	100	100	Rose, W W.....	unissued	44	100	00	M Moritz, Trustee.....	324	10
Shaw, Prosper P Trustee.....	66	100	100	Rose, W W.....	unissued	45	100	00	M Moritz, Trustee.....	325	10
Shaw, Prosper P Trustee.....	67	100	100	Reuland, James.....	unissued	27	40	00	M Moritz, Trustee.....	326	10
Shaw, Prosper P Trustee.....	68	100	100	Rathborne, R W.....	unissued	136	100	00	M Moritz, Trustee.....	327	10
Shaw, Prosper P Trustee.....	69	100	100	Rathborne, R W.....	unissued	137	100	00	M Moritz, Trustee.....	328	10
Shaw, Prosper P Trustee.....	70	100	100	Rathborne, R W.....	unissued	138	100	00	M Moritz, Trustee.....	329	10
Shaw, Prosper P Trustee.....	71	100	100	Rathborne, R W.....	unissued	139	100	00	M Moritz, Trustee.....	330	10
Shaw, Prosper P Trustee.....	72	100	100	Rathborne, R W.....	unissued	140	100	00	M Moritz, Trustee.....	331	10
Shaw, Prosper P Trustee.....	73	100	100	Rathborne, R W.....	unissued	141	100	00	M Moritz, Trustee.....	332	10
Shaw, Prosper P Trustee.....	74	100	100	Rathborne, R W.....	unissued	142	100	00	M Moritz, Trustee.....	333	10
Shaw, Prosper P Trustee.....	75	100	100	Rathborne, R W.....	unissued	143	100	00	M Moritz, Trustee.....	334	10
Shaw, Prosper P Trustee.....	76	100	100	Rathborne, R W.....	unissued	144	100	00	M Moritz, Trustee.....	335	10
Shaw, Prosper P Trustee.....	77	100	100	Rathborne, R W.....	unissued	145	100	00	M Moritz, Trustee.....	336	10
Shaw, Prosper P Trustee.....	78	100	100	Rathborne, R W.....	unissued	146	100	00	M Moritz, Trustee.....	337	10
Shaw, Prosper P Trustee.....	79	100	100	Rathborne, R W.....	unissued	147	100	00	M Moritz, Trustee.....	338	10
Shaw, Prosper P Trustee.....	80	100	100	Rathborne, R W.....	unissued	148	100	00	M Moritz, Trustee.....	339	10
Shaw, Prosper P Trustee.....	81	100	100	Rathborne, R W.....	unissued	149	100	00	M Moritz, Trustee.....	340	10
Shaw, Prosper P Trustee.....	82	100	100	Rathborne, R W.....	unissued	150	100	00	M Moritz, Trustee.....	341	10
Shaw, Prosper P Trustee.....	83	100	100	Rathborne, R W.....	unissued	151	100	00	M Moritz, Trustee.....	342	10
Shaw, Prosper P Trustee.....	84	100	100	Rathborne, R W.....	unissued	152	100	00	M Moritz, Trustee.....	343	10
Shaw, Prosper P Trustee.....	85	100	100	Rathborne, R W.....	unissued	153	100	00	M Moritz, Trustee.....	344	10
Shaw, Prosper P Trustee.....	86	100	100	Rathborne, R W.....	unissued	154	100	00	M Moritz, Trustee.....	345	10
Shaw, Prosper P Trustee.....	87	100	100	Rathborne, R W.....	unissued	155	100	00	M Moritz, Trustee.....	346	10
Shaw, Prosper P Trustee.....	88	100	100	Rathborne, R W.....	unissued	156	100	00	M Moritz, Trustee.....	347	10
Shaw, Prosper P Trustee.....	89	100	100	Rathborne, R W.....	unissued	157	100	00	M Moritz, Trustee.....	348	10
Shaw, Prosper P Trustee.....	90	100	100	Rathborne, R W.....	unissued	158	100	00	M Moritz, Trustee.....	349	10
Shaw, Prosper P Trustee.....	91	100	100	Rathborne, R W.....	unissued	159	100	00	M Moritz, Trustee.....	350	10
Shaw, Prosper P Trustee.....	92	100	100	Rathborne, R W.....	unissued	160	100	00	M Moritz, Trustee.....	351	10
Shaw, Prosper P Trustee.....	93	100	100	Rathborne, R W.....	unissued	161	100	00	M Moritz, Trustee.....	352	10
Shaw, Prosper P Trustee.....	94	100	100	Rathborne, R W.....	unissued	162	100	00	M Moritz, Trustee.....	353	10
Shaw, Prosper P Trustee.....	95	100	100	Rathborne, R W.....	unissued	163	100	00	M Moritz, Trustee.....	354	10
Shaw, Prosper P Trustee.....	96	100	100	Rathborne, R W.....	unissued	164	100	00	M Moritz, Trustee.....	355	10
Shaw, Prosper P Trustee.....	97	100	100	Rathborne, R W.....	unissued	165	100	00	M Moritz, Trustee.....	356	10
Shaw, Prosper P Trustee.....	98	100	100	Rathborne, R W.....	unissued	166	100	00	M Moritz, Trustee.....	357	10
Shaw, Prosper P Trustee.....	99	100	100	Rathborne, R W.....	unissued	167	100	00	M Moritz, Trustee.....	358	10
Shaw, Prosper P Trustee.....	100	100	100	Rathborne, R W.....	unissued	168	100	00	M Moritz, Trustee.....	359	10
Shaw, Prosper P Trustee.....	101	100	100	Rathborne, R W.....	unissued	169	100	00	M Moritz, Trustee.....	360	10
Shaw, Prosper P Trustee.....	102	100	100	Rathborne, R W.....	unissued	170	100	00	M Moritz, Trustee.....	361	10
Shaw, Prosper P Trustee.....	103	100	100	Rathborne, R W.....	unissued	171	100	00	M Moritz, Trustee.....	362	10
Shaw, Prosper P Trustee.....	104	100	100	Rathborne, R W.....	unissued	172	100	00	M Moritz, Trustee.....	363	10
Shaw, Prosper P Trustee.....	105	100	100	Rathborne, R W.....	unissued	173	100	00	M Moritz, Trustee.....	364	10
Shaw, Prosper P Trustee.....	106	100	100	Rathborne, R W.....	unissued	174	100	00	M Moritz, Trustee.....	365	10
Shaw, Prosper P Trustee.....	107	100	100	Rathborne, R W.....	unissued	175	100	00	M Moritz, Trustee.....	366	10
Shaw, Prosper P Trustee.....	108	100	100	Rathborne, R W.....	unissued	176	100	00	M Moritz, Trustee.....	367	10
Shaw, Prosper P Trustee.....	109	100	100	Rathborne, R W.....	unissued	177	100	00	M Moritz, Trustee.....	368	10
Shaw, Prosper P Trustee.....	110	100	100	Rathborne, R W.....	unissued	178	100	00	M Moritz, Trustee.....	369	10
Shaw, Prosper P Trustee.....	111	100	100	Rathborne, R W.....	unissued	179	100	00	M Moritz, Trustee.....	370	10
Shaw, Prosper P Trustee.....	112	100	100	Rathborne, R W.....	unissued	180	100	00	M Moritz, Trustee.....	371	10
Shaw, Prosper P Trustee.....	113	100	100	Rathborne, R W.....	unissued	181	100	00	M Moritz, Trustee.....	372	10
Shaw, Prosper P Trustee.....	114	100	100	Rathborne, R W.....	unissued	182	100	00	M Moritz, Trustee.....	373	10
Shaw, Prosper P Trustee.....	115	100	100	Rathborne, R W.....	unissued	183	100	00	M Moritz, Trustee.....	374	10
Shaw, Prosper P Trustee.....	116	100	100	Rathborne, R W.....	unissued	184	100	00	M Moritz, Trustee.....	375	10
Shaw, Prosper P Trustee.....	117	100	100	Rathborne, R W.....	unissued	185	100	00	M Moritz, Trustee.....	376	10
Shaw, Prosper P Trustee.....	118	100	100	Rathborne, R W.....	unissued	186	100	00	M Moritz, Trustee.....	377	10
Shaw, Prosper P Trustee.....	119	100	100	Rathborne, R W.....	unissued	187	100	00	M Moritz, Trustee.....	378	10
Shaw, Prosper P Trustee.....	120	100	100	Rathborne, R W.....	unissued	188	100	00	M Moritz, Trustee.....	379	10
Shaw, Prosper P Trustee.....	121	100	100	Rathborne, R W.....	unissued	189	100	00	M Moritz, Trustee.....	380	10
Shaw, Prosper P Trustee.....	122	100	100	Rathborne, R W.....	unissued	190	100	00	M Moritz, Trustee.....	381	10
Shaw, Prosper P Trustee.....	123	100	100	Rathborne, R W.....	unissued	191	100	00	M Moritz, Trustee.....	382	10
Shaw, Prosper P Trustee.....	124	100	100	Rathborne, R W.....	unissued	192	100	00	M Moritz, Trustee.....	383	10
Shaw, Prosper P Trustee.....	125	100	100	Rathborne, R W.....	unissued	193	100	00	M Moritz, Trustee.....	384	10
Shaw, Prosper P Trustee.....	126	100	100	Rathborne, R W.....	unissued	194	100	00	M Moritz, Trustee.....	385	10
Shaw, Prosper P Trustee.....	127	100	100	Rathborne, R W.....	unissued	195	100	00	M Moritz, Trustee.....	386	10
Shaw, Prosper P Trustee.....	128	100	100								

The Silver State.

The Virginia Enterprise, in reviewing the year's work in Nevada, says: Last year, when we published the annual yield of the mines of Nevada, we predicted that in the coming year the yield would be at about the rate of \$1,000,000 for each one thousand inhabitants of the State, which at the time was reckoned at about forty-two thousand. But for the first time the estimate would have been more than filled. The estimate by experts of \$50,000,000 for 1876 is not too large. The present paying mines of the Comstock are offering better promise than they gave a year ago, and we confidently expect that several on the lead which last year made no showing will very soon commence to yield generous returns. In other parts of the State the prospect is brighter than it was a year ago. This is particularly true of Cornucopia, Eureka and White Pine. Valuable recent discoveries have also been made in Austin. The Northern Belle, near Columbus, is a genuine bonanza, and we trust that before the close of the present year Pioche and Aurora will each resume their old places as large lullion producing districts. Tuscarora ought in the early spring to commence adding half a million per month to the product of this State. We expect also before the year closes that the Fryer process for reducing ores will be extensively introduced into the several districts in Nevada. Humboldt county offers a magnificent field for the introduction of that process. Much of the ore there is too base for ordinary mill work. It does not contain the properties to make it smelting ore, and it is too low grade to ship away. If the process is what it is described to be, it is just what is needed, not only there, but in several other districts of the State. Indeed, if all is true that is said of it, its substitution here for the present means of working would reduce the cost very much and add largely to the proceeds. It is well worth the serious investigation of our mining men. But to return to the matter of Nevada's product and Nevada's resources. No country ever offered such a field for the capitalist who desires to invest in mining property. Outside of the range of incorporated mines there slumbers many a bonanza which needs only a little pluck, a little money and some patient, intelligent labor to bring such returns as would make an ordinary fortune seem in comparison but a pauper's inheritance. A flood of water in the Comstock just before the Belcher and Crown Point bonanza was struck, would have made Virginia and Gold Hill almost like Aurora. After the Eureka Consolidated mines were well opened and the furnaces successfully running, a prudent English company declined to purchase for a sum which now, after more than five years of constant working, the property yields monthly. The Northern Belle lay idle for six or seven years, seeking in vain for a purchaser, at a sum which it yields now every ten days. These are samples, and show what is possible in mining. At the same time a man who is made sick by a loss has better stick to dividend paying stock.

Extraordinary Development of Copper in Nevada.

Wonderful as are the mineral productions of the State of Nevada, every day but confirms the conviction that but little is known of the real extent and value of her mineral deposits. Not only are the more precious metals found in untold millions, but the less valuable metals also exist in quantities which, but for the overwhelming deposits of gold and silver, would be sufficient to attract prospectors and capitalists. First comes the intelligence of vast bodies of coal struck in one section, then cinnabar formations of unbroken extent and untold wealth are encountered, and borax, the real uses of which are just beginning to be known to the world, exists all over the State, and now comes reliable intelligence of copper deposits in the range which divides Alkali valley from Masun's valley in the Walker river section. These deposits lie about forty miles south and east of Virginia, and are of unknown extent and value. The ledge is from five to twenty feet in width, has a north and south trend and is well defined, being a contact vein with a western wall of limestone, while the eastern is quartzite. The ore exists in the form of carbonates and red oxides, and is found to be very rich. A few sulphurets have also been found, but none of these have been reduced. Since these gentlemen have been in possession of the claim, they have taken out and disposed of \$50,000 worth of ore, and have as yet scarcely commenced the development of the mine. The cost of extracting and getting the ore to market is now about one cent per pound. The mine is only twenty miles southeast of the El Dorado coal mine, and when the narrow gauge railroad shall have been completed to that point, the cost of transportation of this copper ore will be greatly reduced.—Virginia Enterprise.

SUSPENSION OF COAL MINING.—A dispatch from New York says that at a meeting of several coal carrying and producing interests on the 20th inst. it was agreed that, in consequence of over production and accumulation of unsold coal upon the market, an entire suspension of all mining of anthracite coal for five weeks, from February 7th to March 11th inclusive, be ordered.

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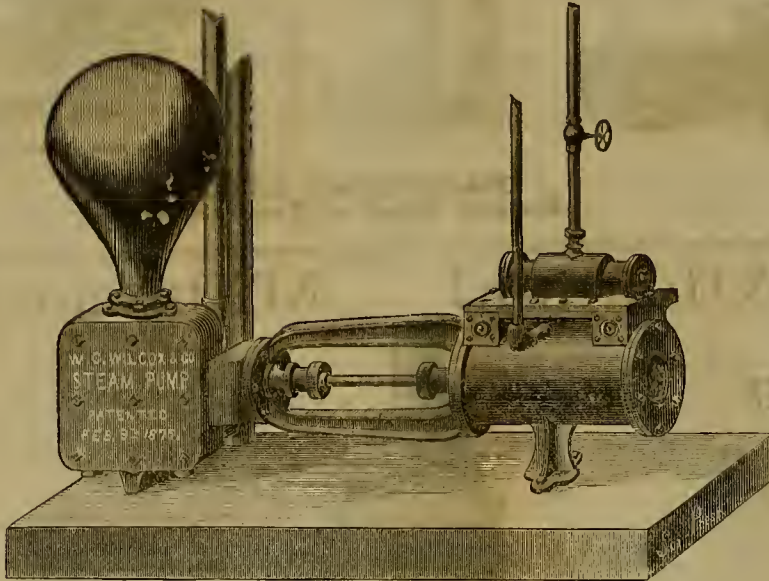
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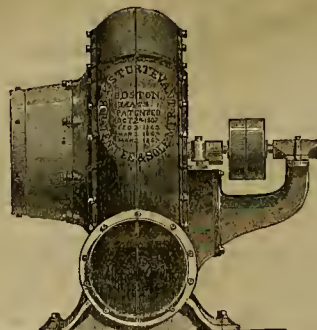
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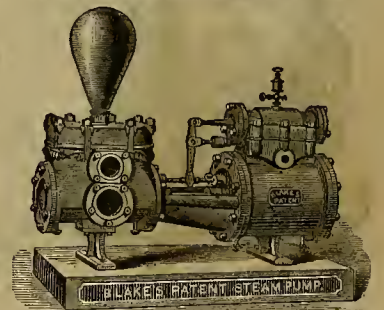
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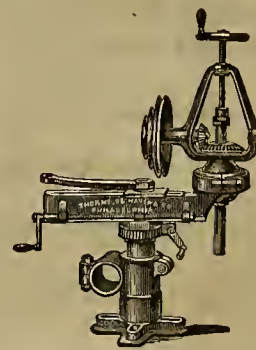
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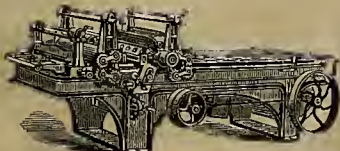
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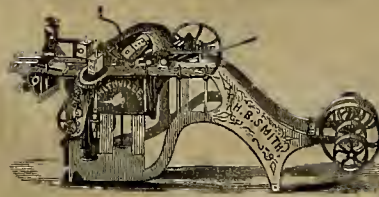


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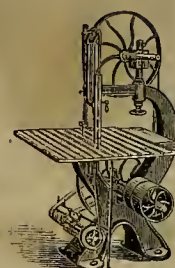
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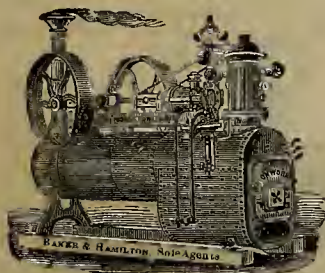
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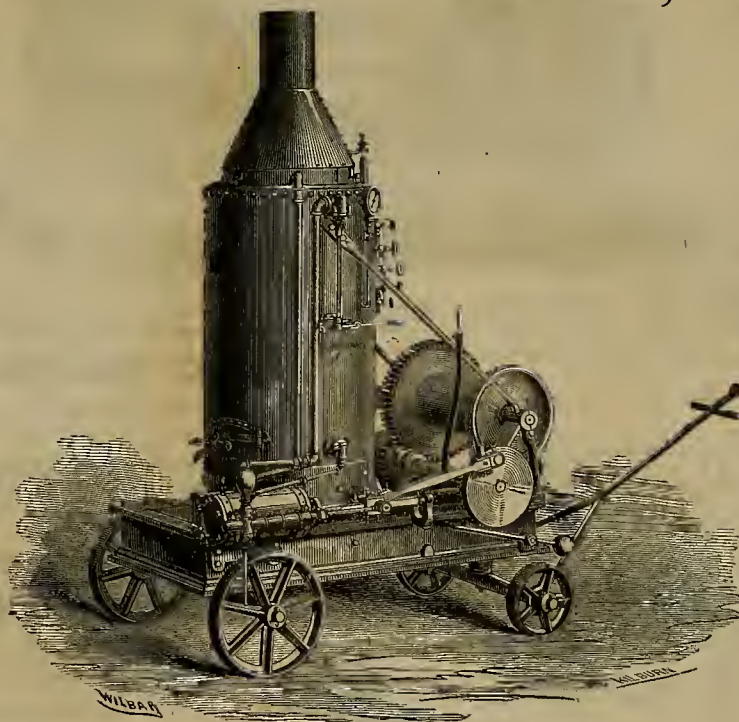
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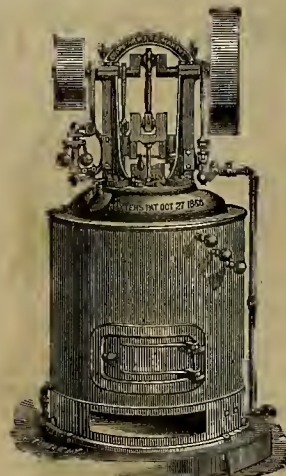


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An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO.,
Patent Solicitors.

SAN FRANCISCO, SATURDAY, FEBRUARY, 5, 1876.

VOLUME XXXII
Number 6.

Removal of Prominent Manufacturing Firms.

The engraving on this page is a representation of the handsome building just completed at No. 417 Market street, between First and Fremont. The main floor and basement have been taken by Messrs. Fairbanks & Hutchinson, Parke & Lacy and F. Ogden, the whole making a commodious and convenient sales-rooms as there are in the city.

Messrs. Fairbanks & Hutchinson, the California branch house of Fairbanks' standard scales, have recently removed to this new place of business from No. 537 Market street, and now have more roomy quarters, giving them plenty of space for the exhibition of every variety of their goods. Fairbanks' scales are so well known all over the country, and the world in fact, that it is scarcely necessary to say anything concerning them, although but few people have any idea of the enormous proportions of the trade. The manufacturing establishment is at St. Johnsbury, Vt., the town being chiefly dependent for its prosperity upon these works. The works themselves are very extensive and completely equipped with appropriate machinery. The foundry uses an average of twenty-one tons of pig iron per day, about three-quarters of which is American iron. The foundry department alone employs seventy-three men, the castings being of all sizes from the massive lever of the great railway scale to a little iron weight or a tiny balance. The works are run by a 250 horse-power engine, with four boilers.

The enormous quantities of raw material which are annually consumed in these works are perhaps the best indication of their magnitude. Nearly 7,000 tons of iron a year are melted up in the foundry, 500 tons of fine sand are used, while 4,000 tons of coal are used in feeding the numerous fires, and from 2,000,000 to 3,000,000 feet of lumber are required from which to make the wood parts and packing boxes. The total product of the works is over 1,000 scales per week. In 1873 the scales made amounted to 45,177 separate scales, the pay roll amounting to \$370,266. These figures show effectively the magnificent proportions on which the business is conducted, although the business has greatly increased since then. The factory employs from 500 to 600 men on regular ten hour time all the year round.

The branch house here, Fairbanks & Hutchinson, receive all their goods from the Fairbanks works, and keep on hand all the different kinds of scales which are required. This is a branch house, not an agency, and goods can be bought from Fairbanks & Hutchinson the same as from the factory itself. This branch controls all the Pacific coast trade, China, Japan and the islands of the Pacific. China and Japan now use large quantities of the scales and the trade in that direction is increasing quite rapidly. Fairbanks & Hutchinson have in their new quarters a fine salesroom, plenty of space for storage and all the conveniences for carrying on an extensive business.

Parke & Lacy.

Another firm which occupies this building is that of Parke & Lacy, agents for the Burleigh drills and air compressors, the Putnam machine company's machinists' tools, Haskins engines, Wright's steam pumps, mining machinery, etc. These gentlemen established themselves in business in this city about two years since, starting in on a small scale. Their business has steadily increased, and they have now "branched out" more extensively to keep pace with their trade, having now a fine large store with a heavy stock of goods on hand. They make specialties of everything they handle, and as they only keep first-class articles of the kind dealt in, have succeeded in building quite an extensive trade in their particular line. Both of these gentlemen are practical machinists and thoroughly understand their business.

The building is 134x34, and they use about one-half of two floors, the other half being taken up by the before mentioned firm. On the main floor are samples of the machinery in which they deal. They have on hand some ten carloads of the Burleigh drilling machinery,

and as much more of the Putnam Machine Co.'s tools and Haskins engine. They ship about a carload a week, and have about three times the quantity of machine tools of any one house in town.

The big air compressors for the Burleigh drills are of course kept at the warehouse; but in the basement are kept all the rest of the Burleigh drilling machinery, ready packed for

this connection would be superfluous. There are now sent 150 drills of this manufacture in operation in different parts of the coast. The majority of the machine drills used on the Comstock are of this pattern, and the air compressing machinery is now extensively used for hoisting and various other work in the mines, as well as for running the drills. Messrs. Parke & Lacy have been very active and ener-

getic in introducing this machinery, and it is now more extensively used among us than any other of the same class.

Another specialty of this firm is in Putnam machinists' tools, of which a great variety is made. A number of different sized lathes, planers, drills, etc., are to be seen at the store, and a good supply is kept on hand. These tools have a reputation for strength, elegance of finish and accuracy of workmanship, and they have been extensively introduced. Parke & Lacy also have several sizes and styles of the Haskins portable engine, which are furnished, if desired, with boiler and connections complete. Yacht engines of this pattern with reversing gear, etc., are also on hand. These engines have a reputation for economy and strength, and are neatly gotten up.

Parke & Lacy are also agents for the Heald & Cisco centrifugal pump and Wright's bucket plunger pump. Wright's bucket plunger is a small steam pump which may be used as an engine at the same time if desired. The Heald & Cisco centrifugal is designed for raising not as little but as much water as possible, and is not offered therefore for raising very small quantities of water. It is made so as to be able to pump very muddy water, or will discharge pulp, bark, sand, gravel or any such substances which will go through the feed and discharge pipe. It is specially valuable from its heavy throw of water for the surface condensing engines of steamships. These pumps are built up to 35,000 gallons per minute.

Messrs. Parke & Lacy are now much better situated to carry on their business than ever before, having plenty of room, convenient salesrooms, and a large and handsome stock of their specialties. For a young firm they have been very successful and are now established on a scale commensurate with their business interests.

Tulloch's Ore Feeder.

Mr. F. Ogden has also removed from 310 California street to this building, where he has his agency for the sale of the Tulloch ore feeder. These mining appliances are also well known to the mill men of the coast, having been extensively introduced. The machines are simple in construction, and save labor, shoes and dies; and will put through about two tons to each battery, more than can be fed by hand. One man can attend to two hundred stamps if necessary, for twelve hours, with one of these automatic ore feeders. Mr. Ogden guarantees to put the machine to run smooth on any ore that has consistency enough to be scraped. There are now over 100 of these feeders at work on this coast, and those using them have given abundant testimonials to their efficiency.

Messrs. WOLVERTON & CARVER, who have recently bought and been working the abandoned Rocker lode at Butte, Montana, have succeeded in unearthing an extremely rich deposit, some lumps of ore as large as a walnut having been taken out, the specific gravity of which was more than half gold. In one day, recently, they moved and hoisted to the surface over \$5,000 worth of gold.

THE Humboldt foundry made a successful run on heavy castings, Friday afternoon. The charge was the largest yet melted in the cupola, and among the castings molded was a settler bottom, weighing 3,000 pounds, and measuring over nine feet in diameter, for the Humboldt reduction works.

A MONTEA diamond, weighing 300 carats, has been found at Old De Beer's, Cape Town. An old digger by the name of Phillips recently found a superb stone at Du Toit's Pan which weighed 105 carats. He immediately sold it for £3,550.

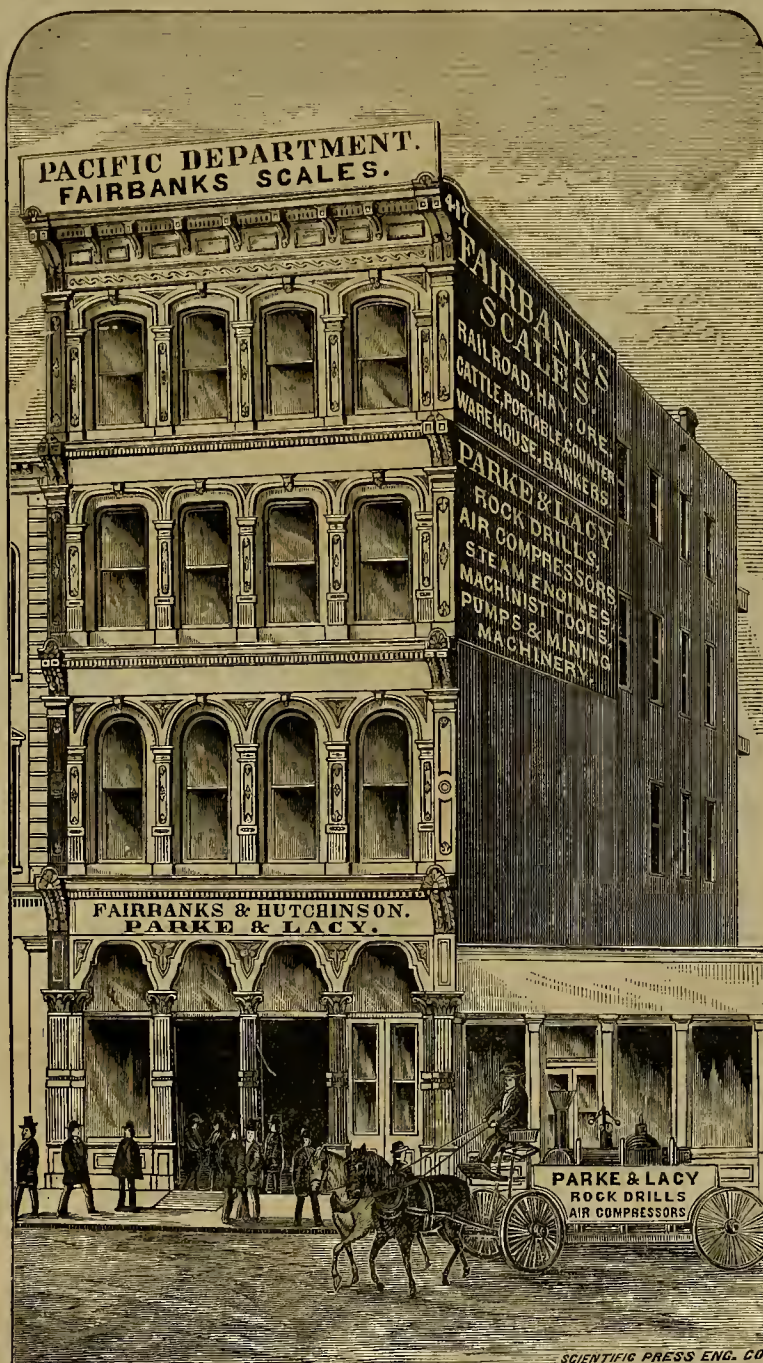
THE Idaho City *World* of January 4th reports snow three feet deep in Boise basin, and snow-shoe traveling is in order. At Summit flat the snow was from five to eight feet deep—more than usually falls so early in the season.

THE late misunderstanding between the rival Chinese companies at Enreka, caused by the trouble at Virginia City, has been amicably settled and the danger of an outbreak arrested.

THE Elko *Independent* asserts that the Leopold mine at Cornucopia now has 6,000 tons of ore in sight, which will not mill less than \$200 to the ton.

THE schooner *Star of Freedom* sailed from San Diego Saturday for Ensenada bay with lumber and supplies for the mines near there, and will bring from there a cargo of ore.

THIRTY-SIX miles of railroad iron is piled up at Pueblo, to be used in the extension of the Rio Grande railway.



THE NEW QUARTERS OF FAIRBANKS & HUTCHINSON, PARKE & LACY AND F. OGDEN.

shipment. Duplicate pieces, extra parts, etc., of all this machinery can be procured here, so that those using the machinery can replace easily what is lost or broken. This is a great advantage where the delay of a week or more waiting to repair damages causes so much expense.

The Burleigh drilling machinery is now so well known on this coast, and its merits have been so thoroughly discussed and demonstrated by practical use, that any description of it in

getic in introducing this machinery, and it is now more extensively used among us than any other of the same class.

Another specialty of this firm is in Putnam machinists' tools, of which a great variety is made. A number of different sized lathes, planers, drills, etc., are to be seen at the store, and a good supply is kept on hand. These tools have a reputation for strength, elegance of finish and accuracy of workmanship, and they have been extensively introduced. Parke &

Quicksilver Prospects in San Simeon District.

A correspondent of the San Luis Obispo *Tribune* says: If you will spare me the space in your valuable journal, it may interest your readers to know something of the quicksilver prospects in this region. The Oceanic has engrossed the attention of every one heretofore, to the exclusion of the undeveloped mines, that, with the decline in the price of quicksilver, were allowed to lie idle, but which, with the rise in the market, will come into notice again.

This part of the country seems to be full of quicksilver, and there are dozens of claims, good and indifferent. Of the good prospects, the Centennial, formerly known as the "Beehive," takes the lead. It was located nine months since by H. Phillips and D. W. Morrison, but until three or four weeks ago it was scarcely known except by the locators. They have unbounded faith in their prospect, but do not care to "blow" it. They have prospected it but very little as yet, being men of limited means. There is every indication, however, that the mine will soon fall into the hands of parties who will prospect it thoroughly. They have a solid hill with enormous croppings from one end to the other. Old miners tell me it is worth more than the Oceanic was when it sold for \$47,000.

Next in importance is the Solitary, which, though having a splendid prospect, and thousands of dollars' worth of mineral ready for reduction, has an incubus hanging over it, in the shape of a complicated lawsuit, that discourages speculation.

The Patsey Ann, named after the wife of the enthusiastic discoverer, is next in order, and has \$3,000 worth of cinnabar on the "dump," but as yet they have failed to find a solid deposit.

On the hill, just above the Patsey Ann, is the White ledge, which has four claims on the same lode, consolidated, upon which has been spent thousands of dollars in fruitless prospecting. A talked-of lawsuit threatens to bring the White company to an untimely end.

There are lesser prospects, such as the Lucky Shot, the Mercury (once a famous prospect) and hosts of "wild-cat claims."

Though most of them will probably prove worthless, some of them will soon "strike it," and when quicksilver reaches its former price, we will celebrate the Centennial in the San Simeon mining district, by the opening up of a set of mines that will cause the Old and the New Almaden to sink into comparative obscurity.

Sun Spots and the Grain Market.

A German philosopher, who, with the persistence peculiar to that people, has been watching the sun spots day by day for the past forty years, has discovered that they occur with increased frequency at regular intervals of about eleven years. This discovery has also been supplemented by another no less remarkable, viz.: that the maximum variation of the magnetic needle exhibits the same periodicity, and that the two are exactly coincident. It is also found that magnetic storms have the same cycles.

And now comes Professor Jevons, who reads a paper before the British association, in which he cites some very curious relations between the solar spots and some other terrestrial events. He called attention to the fact that Mr. Carrington had traced a connection between the variation of sun spots and the price of grain; also that Mr. Schuster had pointed out that the seasons of superior vintage in Europe occurred at intervals coincident with the eleven year cycles of sun spots. This fact, he said, was substantiated by a reference to the "History of Agriculture and Prices in England from 1259 to 1400," published some years ago by Professor Rogers.

It is found by reference to that work that the prices of the various kinds of produce in England have risen in the first four years of the cycle, but afterwards fallen; and that the maximum of prices occurs on the tenth, eleventh, first and second years of the assumed eleven year periods. These facts are looked upon as especially worthy of note and calling for further investigation.

It was also pointed out that the commercial panics of the past fifty years show a decidedly similar periodicity—the average length of time between the panics being about 10.5 years—nearly coinciding with the eleven year sun spot periods.

Thus it would appear, according to a contemporary, that if Balfour Stewart is right in holding that the sun spot variations depend on the configuration of the planets, it would seem that these bodies are the remote cause of numerous terrestrial phenomena connected with the industrial operations of man, and that the modern astronomer must return by a new road to the ancient astrologer's belief in the influence of the heavenly bodies upon human affairs.

PELICAN MILL.—This fine establishment has been greatly improved and enlarged. It now has a capacity of 350 tons a month. It is supplied with ten stamps, of 650 pounds each, ninety drops to the minute; eight amalgam barrels, holding 2,000 pounds each; five Bruckner cylinders, treating 3,000 pounds at a charge. The power is furnished by water in the summer and by a forty horse-power engine in winter. B. F. Nepheya, a successful mill man, has general charge of the mill. —*Colorado Miner*.

The Famous Mariposa Mill and Mine.

We have information, and that, too, from a reliable source, that it is the intention of the Mariposa land and mining company, some time the ensuing spring, to put a force of men at work on this claim and start the old mill again. This is good news for the people living in our town, and also the county. Our informant is entirely reliable, and was at one time employed on this mill. He further enlightens us that it was told by members of the company that it is their intention, as soon as they strike paying rock in their big tunnel at Bear valley, to commence operations at various points on the grand estate and go for all that it is worth. This embraces our favorite project of introducing water along the divide by means of a canal, which is the grandest of all the enterprises that has been conceived. The success of the Fresno fluming and lumber company shows the practicability of this, and is stimulating the company to action. With a greater supply of water, and timber more inexhaustible, there is every inducement for the company to undertake the project and put it through at an early day. From the day the first blow is struck on this work, the value of the estate will be increased a thousand-fold, and a prosperous future for the town and county of Mariposa. We have ever had faith that there was a brilliant outcome for it, and now we feel assured of the fact. The gentleman to whom we allude has had much experience in quartz mining, and he says that there has never been a day since the old Mariposa was first opened, that, under the right kind of management, it would not pay largely. He says that the stealing from this mine by employees has never been equaled since the first discovery of gold. The vein is well developed, and has as much to recommend it to favorable consideration as any vein in the State. rejoice, people of Mariposa, the day of jubilee is coming! —*Mariposa Gazette*.

The Comstock.

As much as has been said of the Comstock lode those most intimate with it do not comprehend it, while people abroad have no conception of it. Its daily yield is 2,000 tons. That is, from this ore-channel there is every day extracted ore enough to load ten trains of twenty cars each, and those car loads would average \$700 in value each. This is dug out of a space of ground less than three miles in length and less than 400 feet in width. Indeed, when we confine the estimate to the part of the ledge which at this time is yielding ore, we find that a half-mile in length will cover the whole ground. When we compare the stream of gold and silver to anything ever heard of or read of before in history or romance we discover that everything else ever talked about begins to seem small and mean. Dumas pictured a man who was able through his wealth to almost subvert empires and to make fate his servant. And yet, in the next eighteen months, the Comstock will supply money enough to balance the tremendous account which Dumas placed to the credit of the imprisoned sailor. We see figures piled up in the newspapers which, in dollars, represent the National debt. That debt is so tremendous that though the fortunes of forty millions of people, an empire of three millions of square miles with its cities, townships, mines and fertile soil are all mortgaged for its faithful payment, still the promise of the government (which is the people) to pay is at a discount of fifteen per cent. And yet the Comstock is yielding this year and as it promises to yield for many years to come, it will take but thirty-five years to add to the treasure of the earth as much as that debt today amounts to. —*Enterprise*.

The San Diego Mines.

The San Diego *Union* says: Count Dwarkowski, of Julian City, came in last evening and brings a good report from the mines. There is a good deal of activity, and work is being done on all of the claims. We have an interesting statement showing the number of men actually at work on the different mines on the 13th inst., as ascertained by a personal visit to the ground. It should be understood, too, that several of the more prominent mines have been running short handed for the last three weeks, on account of the fact that the supply of giant powder used in blasting was exhausted about the 25th of December. A supply is expected by the next freight steamer, when the working force will be a third larger than at present. The statement referred to is as follows:

Julian District.

Helvetia mine, 18 men, and 8 additional cutting wood, burning charcoal, and at other work outside the mine; Tom Scott mine, 6; Pride of the West, 3; Good Hope, 2; Van Wert, 2; Owens Extension, 3; O'Connor, 2; Gardner, 3; Butler, 3; Washington, 2; Hayden, 2; San Diego (East), 2; Helvetia Extension, 1; Merry Christmas, 2; Mountain Brow, 2; Big Blue, 2; Canadian, 3; Mabel, 2; Belcher, 3; United States Tunnel, 2.

Banner District.

Ready Relief, 12; Hubbard, 4; Chariot Extension, 3; Ella (North), 5; Ella (South), 3; Florence, 3; Kennedy, 4; Cable, 2; The Dane, 1; Madden, 2; Antelope, 2; Sacramento, 3; Hidden Treasure, 4; Extension Hidden Treasure, 3; Kentuck, 5.

Mesa Grande.

Shenandoah, 3; Oriflamme, 2. In the three mills running on the date specified ten men were employed.

The Franklin Claim.

A correspondent of the Dutch Flat *Forum*, (Placer county) writes to that paper as follows: I have perused from time to time, in each succeeding issue of the *Forum*, well written productions of your numerous correspondents from the surrounding districts on mining. The original aphorism "a fait heart never won fair lady" (neither will a dumb pen echo the achievements of wisdom, nor the rewards of merit) prompts this my first effort. Without further preface I venture forth and pluck garlands to decorate the fair brow of the Franklin claim. A few paces from Main street, Dutch Flat, will suffice to tread the boundary line of the claim. It is owned by an incorporated company, among which are represented prominent millionaires—the proprietor of the Palace hotel carves the "fatted calf." Mr. Teafie represents the company here, commands an interest in and superintends the claim. The original Franklin was first prospected and located in 1854 by the superintendent of the modern Franklin enlarged. At that time it only covered a small area; it since absorbed the boundary claims, viz.: Williamaloo and D. F. W. company on Bear river side, on Dutch Flat side, Little Hope, C. P. R. R. company and St. Nicholas. All those claims are now consolidated, containing an area of forty-five acres. Most of the ground has been superficially stripped. The ambition of the primary operators was gratified like the whale fishers, strip off the blubber and leave the mammoth body intact. But we must not reflect on their energy; for like all other pursuits the hydraulic infant has made rapid strides to maturity. The present indications of the claim are auspicious of satisfactory results in the near future. Work on the tunnel and shaft is prosecuted vigorously night and day.

The Shaft.

From the surface the workmen are sinking perpendicularly through the gravel to junction, with an incline running at an angle of 30 deg. through bedrock connecting with the tunnel. Taking the bottom of the tunnel as the base of a right angle, the altitude of the perpendicular to the surface will measure 150 feet. Consequently 100 feet of gravel and 50 feet of bedrock would have to be penetrated, were it not for the prolongation of the tunnel to a point vertical to an indentation on the surface. The gravel extracted from the shaft prospects richly. When exposed to the atmosphere for any length of time it severs from the component parts very easily. It is constituted of conglomerate rock crystals, argillaceous schist or slate, silicates, and is of a bluish color. While I was investigating the gravel "dumps" at the shaft, I noticed several pieces of petrified wood, some of which retained the original grain; others were in an advanced state of decomposition, and were almost reduced to "peat." The tunnel intersects the hill at a low point, in a ravine emptying into Bear river. Its course is about northeast and southwest. It is at present in a distance of 400 feet, and will, when required, be continued until it taps the subterranean channels farther south. The rock through which it has been driven is extremely hard, and by striking it with a hammer sounds like the horn of a blacksmith's anvil. Notwithstanding, the bore, which is 8x6, is as true as an Armstrong "muzzle." The reader who may possess any knowledge of mining, no matter how limited, will readily assert that a piece of mechanism thus could only be accomplished by wisdom not deducted from theory.

The Boxes

For the flume are to have ten inches grade to every twelve feet; in case of omission it would be well to state that they are not erected on a frail or sandy foundation; on the contrary, they are firmly imbedded in rock. That is one of Mr. Teafie's characteristics, "whatever is worth doing at all is worth doing well." The principal essential of gravel mining is to have a securely adjusted "grade" for the boxes, so that the velocity of the water or "tailings" carried through the flume may not be increased or diminished. Twenty-five boxes and three under-currents are in course of construction to the mouth of the tunnel, and will be immediately paved with "riffles." After the escape of the water and debris from the flume, it will empty into a gorge 800 feet from the river. When the washing commences the view from there will be one of indescribable grandeur. Without unforeseen events arise, the Franklin gold mining company will, by the 1st of February, be accumulating amalgam which in 30 days from hence will be coined into "twenty-ties."

STAR DISTRICT.—W. L. French, superintendent of the American Basin mine in Star district, received a box of ore yesterday which was taken out of the mine a few days ago. Some of the specimens assayed \$1,000 per ton in silver and the whole averages \$700 per ton. Work was resumed on this mine a few weeks ago, and the prospects of developing a good lead are very encouraging. From present indication Star promises to prove what many miners always believed it would, a good mining camp. Since the completion of the Sheba hoisting works, by which the mine has been drained, some valuable deposits of ore have been developed at a greater depth than it was possible to sink before, on account of water. The superintendent, Peter Woolcock, is an experienced miner, and is working the mine systematically. —*Silver State*.

The Defiance Mine.

In a late number of the *Bakersfield Courier* appears a description of the mine in Darwin district, Inyo county, from which we extract the following concerning the representative mine and its furnace: The Defiance, showing the greatest body of ore in the district, and being now partially opened and in operation, may properly claim our first attention. This mine was discovered a little more than a year ago. For some time there was some conflicting claims to it, but these are now adjusted, and it is owned by the Defiance mining company, a regular incorporated company. A small portion of the stock only was placed to obtain capital to open it, erect furnaces and get it in running order. This is now accomplished, and the great bulk of the stock remains in the original hands, Messrs. P. Reddy, of Inyo, Sol. Jewett and Judge Colby, of Bakersfield, being really the *bona fide* owners of the mine. It lies about one mile from Darwin, on the east side of Mount Ophir, which is the name of the highest point of the range. The croppings are plainly discernible half way up, jutting out in bold relief on the brow of the mountain. There appear four distinct leads, one above the other, with masses of country rock, as the walls are called, between them. They are of different widths—from twenty to sixty feet on the surface—and all pitching into the mountain. A tunnel, on a horizontal plane, runs in at the foot of the first lead, cutting it obliquely, passing through it into the country rock, through that and through the next lead. It is still being pushed through to cut the four leads which it is supposed converge at a certain depth and form one grand lead, probably one hundred and fifty feet in width.

These leads pitch downward at an angle of about sixty degrees. On the first one a shaft goes down with the incline of the lead some one hundred and forty feet. Here they are opening breasts and drifts, and the character of the ore is improving—the gray carbonates, rich in silver, taking place of the galena. Everywhere, as one wanders through this great mine, above, around and beneath, he is confronted with one great mass of glistening ore; so vast is the quantity that it appears at first sight that it will be impossible to exhaust it, even at the trifling depth that has already been attained. A good wagon road has been made from the mine to the furnace, a distance of seven-eighths of a mile, whither the ore is conveyed. The furnace has been completed but a short time, but everything is found to work perfectly well. It has a reducing capacity of thirty tons per day, and is now turning out about one hundred and fifty bars of bullion per day, worth from \$150 to \$200 each. In the furnace about twenty-five men are employed, in three shifts working night and day. In the mine from forty to fifty men are employed. We cannot close this brief and imperfect notice of this great mine without referring to its superintendent, Mr. P. Reddy, to whose energy, good management and sound judgment the condition of the enterprise is to-day an enduring monument. Here is a great mine, in a fair progress of development, furnace on the ground, and a few days ago twelve hundred bars of bullion on the ground, where but a few months ago there was nothing but a pile of rusty rocks. It cost \$30,000 up to the time the first bar of bullion was turned out. The first month of its operation it will pay its way and the considerable expense incurred in opening it properly. Next month Mr. Reddy expects that the Defiance will declare its maiden dividend. It is certainly no flattery, but simply a just and honest tribute to the superintendent, to say that there is no record in the State of a similar instance in mining.

The Golden Cities.

At a point on the railroad about half-way between Dutch Flat and Gold Run, can be seen the towns of Iowa Hill, Gold Run Dutch Flat and Little York, four of the busiest mining towns, or, taken as a whole, the busiest and liveliest camp in California. In this small scope of territory of about twelve miles in length by two in width, more men are employed and more money paid for labor than in the whole of any one agricultural county in the State. A very low estimate of the money expended for labor alone would place it at \$60,000 a month, which is not by any means the bulk of the expense of mining in this district; but will reach, perhaps, a little over one-third; and the products justify this large expenditure of money. Every claim that is now being worked pays expenses, while there are not a few which are paying handsome dividends to the stockholders, and that, too, with flattering prospects for still larger returns. A glance from the point indicated, and the eye will glance over more gold not yet gathered in than we read of in fabled history, and to which those golden images of the days of Solomon, or all his repented wealth, would be but as a haudful compared with the wealth of the Bank of California. —*Dutch Flat Forum*.

Work is again progressing on the old Union mine at Copperopolis; the mine is being pumped out and there is a prospect for another lively time in that vicinity. The concern is now clear of litigation, and is owned by Messrs. Glidden and Williams, of Boston.

The Humboldt sulphur mines are turning out a product beyond the highest expectations of the owners, and thousands of tons are now in sight.

SCIENTIFIC PROGRESS.

Science and Discovery.

What science and the mechanic arts have done for the world's advancement in comfort may be faintly guessed from the survey of a week's work at the manufacturing city of Birmingham alone. Its results are the making, among other things, of 14,000,000 pens, 6,000 bedsteads, 7,000 guns, 300,000,000 cut nails, 100,000,000 buttons, 1,000 saddles, 5,000,000 copper or bronze coins, 20,000 pairs of spectacles, six tons of paper mache wares, more than £30,000 worth of jewelry, 4,000 miles of iron and steel wire, ten tons of pins, five tons of hair pins and hooks and eyes, 130,000 gross of wood screws, 500 tons of nuts and screw bolts and spikes, fifty tons of wrought iron hinges, 350 miles' length of wax for matches, forty tons of refined metal, forty tons of German silver, 100 dozen of fenders, 3,500 bellows, and 800 tons of brass and copper wares.

By a simple method, now much used abroad, the inner diameter of tires which have been unduly enlarged by the hammer or rolls is reduced with ease. The tire is heated to redness and then plunged horizontally, but only to half its breadth, in water, where it is left until quite cold. This operation is repeated in the same position, and afterward the tire is turned over, and the heatings and plungings applied to the other half. The first cooling produces a contraction of which the part not immersed partakes and thus undergoes a molecular retraction, resulting in a reduction of the diameter. The same effect is produced in the other half during the second operation. In this way, it is said, a tire has been reduced seven units in 85; and four immersions will double the shrinkage. By the method here indicated a ring of Bessemer steel, which had been greatly enlarged under the hammer, was given the desired diameter by heating and immersing thirteen successive times—first the side which was contracted and afterward that which had become enlarged. The correction amounted to nearly four inches.

A mammoth telescope, said to be the largest ever made, is now in process of construction at a factory near Dublin, Ireland. It is building at the order of the Austro-Hungarian government for the new observatory at Vienna, to be finished by the autumn of 1878. The object glasses will have an aperture of about twenty-seven inches. The focal length is to be about thirty-two feet. The great base casting, weighing some seven to eight tons, will form a chamber about twelve feet long, four feet six inches wide, and eight feet wide for the clock, which will be supplied with anti-friction apparatus. The tube will be entirely of steel, and all the various motions of the instrument, as well as the reading of the different circles, will be available to the observer from the eye-end of the telescope.—*Ex.*

The Technology of Iron.

The following interesting items in relation to the technology of iron are from the report of David Forbes, F. R. S., to the Iron and Steel Institute, and published in the *Journal* of the institute:

Magnetism of Iron.

It has generally been accepted that iron at a red heat was incapable of being rendered magnetic, and this was sustained by Eliss, in *Poggendorff's Annals* for 1872; the reverse of this is now, however, maintained by M. Gangain, in a communication to the Academy of Sciences, in Paris, February 1st, who states that if it is wished to saturate a bar of iron with magnetism, the best method of doing so is to magnetize it whilst its temperature is very elevated.

Magnetism of Steel.

Commandant Treve has communicated to the Académie des Sciences the results of experiments made by himself and M. Durassier, the head of the chemical department at the Creusot works, on the connection which exists between the nature of the steel and its magnetic force. Fifteen bars of steel were selected, which were divided into five sets, each of which received a different temper, after which M. Treve magnetized them to saturation, and then determined their magnetic force by the method of deviation. Those bars which contained 0.950 per cent. of carbon, and which were hardened in cold water, gave a maximum of deviation represented by the number 47; whilst a bar with the same amount of carbon, but hardened in boiling water, gave the number 44; and a third bar, also with the same amount of carbon, but hardened in oil of a temperature of ten degs. centigrade (fifty degs. Fahrenheit,) only gave 43, showing that the fluid used in hardening exerts an influence.

The effect of the amount of carbon contained in the steel is also established, for whilst the maximum of deviation of the above mentioned bars, which contained 0.950 per cent. of carbon, was found to be 47, other bars containing 0.250 per cent. of carbon only showed a deviation of 13. In laying down the curves of variation, the influence of the amount of the carbon and of the hardening media was sensible enough, but the effect of the latter was smaller in proportion as the former increased, and M. Treve has ascertained the fact that the magnetic curve of a steel bar coincides with its curve of elasticity, thus proving that carbon not only gives to steel its elasticity, but also its magnetic capacity.

The Relation of Battles to Storms.

It has been observed for many centuries that storms, or meteorological changes of a striking nature, occur during or at the close of great battles. Whether these results are to be regarded as coincidences, or as the sequence of physical disturbances in the atmosphere, is a question not decisively settled. Of the fact that storms do occur in close connection with battles there is no doubt. During the late war in this country, hardly an action of any magnitude took place which was not accompanied with wind and rain. The operations on the Peninsula under McClellan were apparently productive of continuous rains, and in the great fights around Richmond and Petersburg meteorological disturbances occurred which at times seriously impeded military operations. So, too, abroad. The loss of the great battle of Solferino was attributed by the Austrian commander to a terrific thunder storm which burst over the field and obscured movements of powerful masses of the enemy. The decisive battle of Sadowa, which closed the Austro-Prussian war in 1866, was in like manner accompanied by a violent storm. Napoleon was heard to remark that so certain was he of causing rain by the explosions of his artillery during battles, that he disposed his troops in a way to take advantage of clouds when they formed.

No reasonable objection can be urged against the theory that great explosions, producing violent concussions in the air, may change its hygrometric conditions and cause condensation of moisture. Besides the disruptive effects produced in a great battle, there is the evolution of much heat, from the combustion of gunpowder and from the massing together of large bodies of men. Altogether, it is not difficult to find satisfactory causes for sudden meteorological changes during great battles, and therefore wind and rain are not to be regarded as simply coincident with active proceedings in war. It may be urged that our national anniversary, the Fourth of July, is usually clear, notwithstanding the vast amounts of gunpowder burned in all parts of the country. This does not, however, meet the case; the explosions occur all over the country and are comparatively upon a small scale. There is not usually a decided concentration of noise at any one point. If this occurs, a shower is pretty certain to take place. Last year the day was particularly noisy in Eastern Massachusetts, and in the afternoon the most violent thunder storm of the season burst over that section of country. The question is one of much interest to meteorologists, and is worthy of a more careful consideration than it has received.—*Journal of Chemistry.*

Distribution of Temperature on the Earth.

The distribution of temperatures upon the globe is a subject of profound popular and scientific interest. More than any other, it affects the distribution of living forms, not only in zones of climate, but in geological time. The contour of the earth's surface, and the relation of land and water upon it, may produce important local changes, or establish local isotherms and isobars, but these are scarcely more than modifications of grander and more general results. Arctic plants may, indeed, flourish under the equator, but only on mountains where an arctic climate prevails. Heat determines the limits equally of the vine, the palm of the tropics, the cereals of the temperate zone, and the food of the reindeer. Whether or not tree-ferns grow in Pennsylvania, and forests of pine in the Arctic circle, depends on climate. Nor is this a phenomena of the present age only. Geology proves from its records that, while a torrid zone may have existed since climates began, yet polar and temperate regions have witnessed changes both of climate and of life in wonderful succession, and in periods of immense duration.

The causes which have contributed to these results have been sought and studied by some of the most eminent scientists of our time. Humboldt, Sir John Herschel, Sir William Thomson, Lieut. Mury, Sir Charles Lyell, and more recently Dr. Carpenter and others, have investigated the subject in many of its aspects, and their conclusions are before the world; but no one, we believe, has presented it from so many points of view, or attacked its complex problems with greater vigor than Mr. James Croll, whose volume is now before us. His conclusion is, that not only great secular changes of climate, but the distribution of temperatures upon the earth's surface at the present time, are due to causes which alter the volume, intensity, and direction of the trade-winds and other prevailing winds of the globe. For the question at issue is not the amount of heat received upon the earth's surface, but the means by which it is distributed.—*Popular Science Monthly.*

HYDRATED CELLULOSE.—It has long been remarked that, under the influence of acids, cellulose becomes extremely friable. Paper bleached with a too large excess of chloride of lime, and linen submitted to the action of sulphurous acid, which transforms itself into sulphuric acid, may by the least pressure be reduced to powder. M. Girard, after a series of elaborate experiments, concludes that this transformation is due to the fixation of an equivalent of water by the cellulose, and he has produced the hydrate synthetically. It is a white substance, very easily pulverized. M. Girard considers that this hydration of cellulose plays an

important part in the economy of nature, and that the production of rotten wood, ulmine and ulmic acid is always preceded by that of the newly discovered hydrate.

The Danks Furnace in England.

For some reason or other much difficulty has been encountered in introducing the Danks furnace in England. The advantages of this furnace were first brought to the attention of English iron masters at the Dudley meeting of the Iron and Steel Institute in 1871, by a paper read before that body. Although the invention was an American one, Mr. Danks being at the time of the invention an American naturalized citizen, and a resident of Cincinnati, it was at first regarded with much favor in England, for the reason that the inventor was an Englishman by birth—a South Staffordshire man.

At this time it was reported favorably upon and several furnaces were erected and set to work. After a time, however, they seemed to have failed, chiefly from defects in mechanical construction, but in a large degree from the prejudice of workmen against their use on account of their labor saving features. These failures caused much disappointment, and served to prevent their general introduction into other localities.

Experience, however, soon suggested important modifications in their mechanical construction, and time gradually wore away the prejudice which they encountered at first from workmen. This improvement was largely brought about through the efforts of Mr. Robert Heath, of the Ravensdale iron works, of North Staffordshire. He started with six of these furnaces and has since added four more. The practical interest which he took in the matter, and the success with which he was rewarded, induced the Steel Institute, at its last meeting, to visit his works in a body. The visit was very satisfactory, and a report was made to that effect, which will doubtless result in a very general introduction of the Danks rotary puddler in all the great iron districts of England.

Mr. Heath is now rolling Danks blooms into sixteen inch bars, twenty-four feet long. He is also manufacturing heavy plates and a great variety of smaller sizes of merchantable iron, and is perfectly satisfied with the success which is attending his efforts. Iron can be produced by this process very much cheaper than by the ordinary hand work, on which account the success in this direction is considered a matter of much importance to all ship builders, mechanics, engineers and all others who use wrought iron on a large scale. The invention has been considered a success in this country from its very start, perhaps for the reason that various improvements have been introduced from time to time, under the practical eye of the inventor himself, and of course sooner than they could be reached in England.

EXHAUSTION OF THE SOIL BY APPLE TREES.—M. Pierre, a French scientist, calculates that, in a life of sixty years, an apple tree removes from the soil sixty pounds of nitrogen, equal to 11,500 pounds of farmyard dung. To maintain the soil in condition, therefore, about 175 pounds of dung ought to be annually given per tree during the fifty years that it is bearing.

MECHANICAL PROGRESS.

The Screw Propeller—Old and New.

The screw propeller has been in practical use only about forty years, although its ideal origin runs back much farther, and was first constructed for use in the air as a sort of revolving sail. Thomas Jefferson, writing from Paris in 1785, describes a vessel then recently invented, which he examined while in operation. He says the inventor did not know himself the principle of his invention. "It is a screw with a very broad or thin worm, or, rather, it is a thin plate, with its edge applied spirally round an axis. This being turned, operates on the air as a screw does, and may be literally said to screw the vessel along." * * * The screw, I think, would be more effectual if placed below the surface of the water." Mr. Jefferson adds to his notes on this invention that he thinks Mr. Bushnell, of Connecticut, has a prior claim to the invention of the screw as a motive power for vessels. During the Revolutionary war he invented a submarine torpedo vessel, to be driven by screws. This torpedo was the original of Fulton's, and may have been the first instrument of its kind, but the screw had been suggested as a motive power for vessels long before the time of Bushnell. Brande's dictionary says that "the screw propeller is probably as old as the windmill, and a windmill of the construction now usually employed is represented in the 77th proposition of Hero's *Spiritalia*, a work written 130 years before the Christian era." For a century and a half efforts were made to introduce the screw as a propeller of vessels before Ericsson and Smith successfully demonstrated the utility of the screw, and its advantages over paddle wheels. The history of this, as of most other inventions, shows that the world must wait for its laggards; that it cannot advance rapidly along one line of discovery, or of useful application, until it has advanced or is ready to advance along others. Abnormal or premature growths are sure to be "nipped in the bud."

Who Invented the Barrel?

Few inventions have had a wider or more varied usefulness than the barrel; few give such promise of perpetuity. Unique in principle, simple yet singularly perfect in plan and structure, the barrel is little less than a stroke of genius. Who set up the first one? Who first conceived the happy thought of making a vessel tight and strong out of strips of wood bound together with hoops? And when did he live?

No history of inventions, none of the encyclopedias in our great libraries, no historian of human progress, so far as we know, give any information on the subject, unless we accept the roman author Pliny, who mistakenly attributes the invention to the Gauls who inhabited the banks of the Po. We say mistakenly, since there is the best of good reason for believing that the barrel was in use long before the Gauls took possession of their Italian home, perhaps long before the Gauls existed as a people.

The monuments of Egypt furnish proof of the early use of hooped vessels, though no date is given of their invention. In one of the inscriptions copied by Wilkinson may be seen two slaves emptying grain from a wooden vessel made with hoops, while a scribe keeps tally, and a sweeper stands by with a broom to sweep up the scattered kernels. Close by an unfortunate is undergoing punishment by bastinado, for short measure perhaps, or, as Mr. Wilkinson suggests, for petty theft. The measure is barrel-shaped, and precisely like the *kayl* of modern Egypt. It would hold, apparently, about a peck. Unfortunately the age of this inscription is not indicated. Measures of the sort would seem to have been in common use very early in Egypt, though not for the storing of liquids, for which purpose skins and earthen vessels were employed.

At first thought, Egypt would be the last place to look for the invention of hooped vessels, its arid climate making it specially unsuited for their employment. Possibly, however, that may have been the compelling cause of their invention.

Throughout the East, the bamboo is largely used for making hollow vessels, a section of the stem through a node securing a solid bottom, and one between the nodes an open mouth for a natural tub or bucket. In well wooded regions, nothing would be more natural than the employment of hollow tree trunks for the same purpose, or sections of tree stems, hollowed out by fire or otherwise. In drying, such vessels would split and spoil, and it would require no great genius to repair them by means of withe or wooden bands, the primitive form of the hoop.

If the users of such natural barrels should migrate to a region where timber was scarce, economy of lumber would be likely to suggest the building of barrels from pieces artificially split, in short, the use of staves, by means of which the primitive cooper would be able to make several barrels out of a block that would suffice but for a single dug out.

But this is speculation merely. It is enough to know for a certainty that the cooper's art, like the potter's, is one of extreme antiquity. We had no suspicion of its venerableness when we began to trace its history in response to the inquiry—who made the first barrel?—*Sci. Am.*

Movable Propeller for Sailing Ships.

This new propeller, designed for occasional use on sailing ships, was first shown at the recent maritime exhibition, Paris. As sailing vessels in our coastwise marine now frequently carry a small steam engine for handling the cargo, the idea of employing a propeller to be used in calm, against head-wind, or as occasion demands, would seem available were it not for the fact that a fixed propeller would only be a drag when not in use. This apparatus is designed to overcome this objection. It consists of an iron frame hung on hinged arms at the stern, and bearing in the centre an upright shaft. At the lower end of the frame work are two toothed wheels for transmitting the motion of the shaft to a short propeller shaft hung below. At the top of the upright shaft is a horizontal grooved wheel for a belt that extends inboard to a wheel connected with the engine. When ready for work, the apparatus hangs partially submerged just behind the rudder, and, by means of the belt, the propeller is readily turned and the vessel moved. When the ship is under sail the belt is thrown off, and by the aid of a hand windlass on the deck, the whole apparatus is lifted out of the water, and may be secured to the edge of the rail, just where the ship's boat commonly hangs. The apparatus may be lowered and put in order in less than five minutes, and in escaping calms, navigating crooked rivers and canals and against light head-winds, will, in the opinion of marine experts who have examined it, prove of great value.—*Scribner.*

THE STEEL BUSINESS OVERDONE.—The manufacturing capabilities of the world in regard to steel appear to be very much in advance of the present demand for that article. Following is a memorandum of the various manufacturing now engaged in this production: Great Britain has now 21 Bessemer steel works, with 105 converters; Prussia, 14, with 61 converters; Austria, 12, with 30 converters; Bavaria, 2, with 4 converters; Alsace, 1, with 2 converters; France, 8, with 25 converters; and United States, 8, with 26 converters. These figures represent an aggregate of 67 works, with 247 converters, whose annual productive power is 2,460,000 tons.

MOKEE, of the St. Louis *Globe-Democrat*, has been convicted of complicity in the whisky frauds.

The Mining Share Market.

The mining share market has not been very active this week, and for several days a depression has been manifest. On Wednesday and Thursday stocks were "off" considerably, as our stock tables show. Prices have by no means been maintained at the figures expected by the hopeful ones, although the reports from the mines continue good. Mining development goes steadily ahead all along the Comstock range. The great bonanza at the north end shows richer and more extensive, and valuable developments are being made in the Imperial, Bullion, Yellow Jacket, Belcher, Overman and other mines of the south end. Throughout the great, broad mineral belt, new prospecting mines are being started into operation daily, regardless of the present severely adverse state of the weather, and when spring and the regular mining season fairly opens, an era of prosperity will be inaugurated never before seen in the history of old Washoe.

On Wednesday morning reports were current upon the streets that Savage had struck a stream of water which had filled the mine for a depth of over four hundred feet, the finding of which is generally regarded as a most favorable omen by those seeking for ore. These rumors proved to a certain extent true, and when the office of the company was opened in the morning a dispatch was found to be on file, reading: "Large quantity of water coming in from the north drift, 2200 level. Has risen to near 2000 level." This, to the holders of Savage who had been long waiting for a good "rise" in the stock, was a damper to their feelings, and again were their expectations blasted. The striking of water is regarded by experienced miners as a very good indication of finding ore, and when the mine is drained of it, it may prove that it came from the ore body.

The Alps mining company, in Ely district, has announced its first dividend, as will be seen by our Shareholders' Directory.

We give in this issue a new table, showing the highest and lowest prices of mining stocks in January, and also for the past week, which we will hereafter publish weekly, corrected to date for the convenience of our readers.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

California.

ALPINE.

ADVANCE.—*Alpine Chronicle*, Jan. 27: The stock of this company is selling at \$4.25 in the San Francisco Stock Board. The company has set apart forty thousand shares as a working capital, and upon the sale of this stock the mine is being worked. The stock is not assessable, therefore purchasers have nothing to pay in this respect, and as a consequence the majority of the stock already sold is in the hands of responsible parties in San Francisco, who are holding it as a safe investment, and not for stock-jobbing purposes, their knowledge of the management of the mine, and the flattering assays obtained from the drillings of the diamond drill in sinking, being incentives to their investments. We can assure those interested in the Advance that the mine is being worked economically as well as systematically. In sinking work has been erected, and the shaft is seven by seventeen feet in the compartments, and is down about eighty feet, the sinking having been done by hand while the steam hoisting works were being placed in position. The drillings from the diamond drill, obtained at a depth of 100 to 200 feet, assayed all the way from \$153 to \$250—made by Strong & Co., of San Francisco. The shaft is being blasted to the depth of 150 feet, upon the completion of which drilling will be resumed to the depth of another 150 feet. It is thought that when the 150-ft level is reached, a good body of paying ore will be laid open, and with the Fryer process, which is said to be eminently successful in reducing rebellious ores, the mine can be made to pay its way to a greater development.

AMADOR.

FIRE EXTINGUISHED.—*Amador Ledger*, Jan. 29: It is a relief to state that the fire which has been smoldering in the Amador Consolidated mine of Sutter Creek is out. For three days last week water was turned into the shaft from the Amador canal, until it reached the drifts where the fire was thought to have taken a tenacious hold. On Friday the shafts were opened and the fire found to be extinguished. The miners who were still in town were notified to return to work. It is the intention to keep the mill running on rock taken from the upper levels of the mine, which have not been touched either by fire or water. No ore has been extracted as yet owing to the presence of bad air. As soon as this difficulty can be overcome the mill will start. The water is being taken from the shaft as rapidly as possible. No time will be lost in freeing the mine from water, but it is estimated that one month at least must elapse before the water can be disposed of. The amount of damage done it is of course impossible to tell.

IN PAY DIRT.—*Trueb & Bellard*, who for two years have been running a tunnel on the Montreal placer claim, have struck the main channel of pay dirt at a distance of 1,050 feet from the mouth of the tunnel. They will commence washing in a few days. The appearance of the pay dirt indicates that the day of recompense for the expenditure of muscle and coin during the past two years is about to dawn.

VOLUNTARY MINE.—The mill in connection with this mine has been idle for several weeks owing to the roads being in too bad a condition to admit of hauling rock from the mine. The prosecution of work in the mine is greatly retarded by the flow of surface water. It is not anticipated that much will be done in the way of crushing until the weather becomes more settled and the roads improve.

A SPLENDID YIELD.—Mr. Pine's small five-stamp mill near West Point bridge was kept running for five days last week on rock taken from his own mine. The clean-up yielded \$1,600, an average of \$30 daily to each stamp. There is plenty more rock of the same character both on the dump and in the mine.

CALAVERAS.

RICH QUARTZ DISCOVERY.—*Calaveras Chronicle*, Jan. 29: We learn that some very rich quartz has recently

been discovered in the vicinity of Latimer's old store, near Central Hill. As yet prospecting has been confined to several narrow "spurs" or "striations" from a large vein which lies in their immediate neighborhood. Rock of unexampled richness has been discovered, in some places the veins showing more gold than quartz. Should the main ledge develop anything like what its offshoots indicate it will prove to be the richest thing in the country.

EWING MINE.—The work of running the 1100-ft level in the Ewing mine is progressing as fast as a full force of hands can drive it. The ledge has already been struck—showing low grade ore, however, as yet—and it is expected that in a short time everything will be in readiness for opening stopes. It has invariably been the case, in all the levels run, that the chimney, when first struck south of the shaft, has shown poor rock; but as the levels progressed the ore increased in richness. In the 1100-ft level the ore has been struck nearer the shaft than in any of the upper ones, and the prospects are flattering that the "lift" will prove extensive and rich. The battery has ceased operations temporarily, the cave of a couple of weeks since having prevented work in the stopes from the 1000-ft level. As soon as the 1100-ft stopes can be opened, however, the stamps will be in motion, and there will be no further difficulty in keeping them constantly employed.

INYO.

DARWIN ITEMS.—During the past week work has been pushed in all the different openings of the Defiance mine, and in every place the quantity and quality of the ore is constantly improving. The "bonanza" in the middle ledge is looking better than ever, but no definite idea of its great extent can yet be formed. The south chimney on the second level looks equally as well, and promises to be just as extensive as that on the middle ledge. We have been about the receipt of live assays of ore taken from the lower levels, which were made on Tuesday last, and it is certainly very satisfactory, showing an average value of \$164.85 per ton and in lead 63 per cent. This kind of ore will produce bullion, allowing for all losses, of about \$500 per ton value. Since the above report was written, P. Reddy, Esq., returned from San Francisco, and informs that having been purchased by the Defiance mine, the company and will be forwarded and erected at once. The works will be run by a donkey steam engine, and are capable of raising ore from a depth of 600 ft. Also, that ore scales have been purchased capable of weighing 20 tons.

DEFIANCE FURNACE.—In consequence of the non-delivery of coal the Defiance furnace was compelled to shut down on last night. It is to be regretted, for it was the wish of the superintendent to ascertain how long an uninterrupted run could be made. As it is, the furnace has run thirty-three days constantly. The shipments since our last issue embrace 684 bars. The total amount, in pounds, shipped since the furnace started is 259,289, and there is a small lot still on hand. Arrangements are now being made for a full and constant supply of coal, and the furnace will soon enter upon a better and more profitable career than ever.

QUEVEDO FURNACE.—This furnace has been running, since our last report, with some slight interruptions, which are always incident to the starting of a furnace. The obstacles are being overcome, and the furnace is now doing quite well. Since starting, the furnace has burned all the anthracite gravel deposit extending from Spring creek to the road leading from Chokechilly to Backbone house and Lake City, and including all the old town site of Columbia Hill. This mine is one of the largest structures of the kind to be found in this part of the State, it being eight feet wide, thirty inches deep, and on a grade of five and three-eighths inches to the foot, requiring over 400,000 feet of 10-inch brick to line it, although a portion is lined with rocks, which seem to run as well as the blocked portions. They are now washing a large portion of the deposits of tailings run from top ground into the ravine adjoining the side hill, which they are now sweeping into this enormous gateway for tailings. They now have a bank of 80 to 100 feet, which grows deeper and deeper as they continue up the side hill, reaching to the depth of 250 feet above grade, before they get to the top of the ground. This mine covers an area of over 1,000 acres of ground, which it is estimated will take from ten to fifteen years to run off with the most approved appliances and machinery for working these immense deposits.

CALIFORNIA MINE.—The Gaston Ridge ledge, owned by Sberiff & Co., of San Francisco, and owned by McDonald, and known as the California mine, is looking splendidly now. The ledge is large, the rock is very rich, and there are about 40 men now employed. Our informant thinks the mine will prove one of the best in the county. The mill has eight stamps, which are kept constantly running on rock taken out of the mine. A large amount of dead work has been done with a view of opening the mine properly. The rock has been assayed, and the expenses and left a dividend besides. In short time the owners intend to enlarge the mill, and work double the present quantity of rock, when the returns are expected to be equal to any mine in the county.

THE MANZANITA MINING COMPANY have been working their claim night and day. The ground is looking first-rate and a big clean-up may be expected. The gold dust begins to come in, and there is plenty of coin at the Bank of Nevada County to buy all that is offered. No one would imagine that coin was scarce after looking at the trays at the bank.

PLACER. **ANOTHER BLAST.**—*Dutch Flat Forum*, Jan. 29: A fine blast of 345 kegs of powder was set off at the Yankee claim yesterday, which was said by experienced miners to be one of the best and most effective they had ever witnessed. The end of the tunnel from which the gold drifts were taken was in 105 feet, from which the drifts were reached, and the rock was blasted to a depth of 100 feet. At 10 o'clock, everything being in readiness, Col. Ludlum had the wires attached to the battery and gave orders for the fuses to be lit, (the superintendent always puts in fuses to make a sure go of it, provided the battery does not work) and as soon as the men could get out of the way the battery was fired, and the blast was heard, and a half a minute later the finest scene that could be witnessed in a lifetime. The earth for the space of about two hundred feet square rose, as if by the hand of magic, to a height of about ten feet, then fell back a crumbled and mixed mass of blue gravel, cement and clay. The sight was beautiful, and the effect was a fact that could be desired and expected by the hotel, or the careful, well skilled men who bossed the work. This blast has loosened sufficient dirt to make one good run.

DRYER.—*Auburn Herald*: When the Auburn gravel mining and ditch company began their project, which contemplated using 500 inches of the water which comes down the Bear river ditch, for mining purposes, the farmers in this section and a few outside farmers, who were not in the ditch for agricultural purposes. It is now proven that their fears were unfounded, as the Auburn mining company has for over a week been using 600 inches of water in their mine, and yet the farmers, according to their own story, have plenty.

PLUMAS.

THE FRANKLIN.—*Plumas National*, Jan. 27: The work on the shaft belonging to this company, on Willow creek, has suspended temporarily, the water having proven too strong for the machinery now in use. The company held a meeting at this place on Tuesday, and concluded to make arrangements for a large boiler which has been used by the North Fork company at Ohio Flat. As soon as it can be put in position at the shaft, work will be resumed. The indications are plentiful that blue gravel is close at hand.

SAN BENITO.

THE STATION QUICKSILVER MINE.—*San Benito Advance*, Jan. 27: We learn that arrangements are in progress by an English company for the purchase of the Station quicksilver mine, but the trade is not yet consummated. The price agreed upon is \$250,000, a small amount for the size and equipments of the district. Bob says when he gets the money he will consider it a sale. In the mean time his men are getting on ore rich in mineral, from which he expects to make his pile, sale or no sale.

SISKIYOU.

MINING IN THE KLAMATH.—*Yreka Journal*, Jan. 27: Mining operations in the Klamath at and near Hamburg bar, below the mouth of Scott river, are being carried on very extensively and successfully, and more gold will be taken from that section this year than during any previous one. Kittlewood & Co. took out over 108 ounces last week, and will probably take out over \$200,000 of gold this season. The rise in the price of winter storms. Bean & Co. are almost ready to take out the pay gravel and have been taking out some gold already. They crowded the river over on the opposite bank, so as to be sure of getting in the old channel, and were considerably beyond the channel sought, otherwise they would have been in the pay gravel some weeks ago. Learned & Co. are also nearly ready to get out the pay gravel from the river bed, and rich reports may soon be expected from their claim.

Nevada.

WASHOE DISTRICT.

CONSOLIDATED VIRGINIA.—*Gold Hill News*, Jan. 27: Daily yield, 600 tons of ore. The entire mine is simply looking splendidly, and is giving renewed promise day after day of richer and greater bodies of ore to uncover in the lower levels than have yet been opened in any portion of the mine already prospected. The mills are all kept steadily running, notwithstanding the fearfully stormy state of the weather and had condition of the roads, and the yield for the month will reach and perhaps exceed \$1,800,000. The broken spur wheel of the new California mill has been replaced, and one of the batteries was started up yesterday morning, everything working finely. The other half went into full operation this morning. This will add a crushing capacity of 280 to 300 tons per day to that already employed.

JULIA.—The main southwest drift on the 1400 ft level is pushed steadily ahead, having passed entirely through the hard belt of porphyry into quartz of a very fine character. The drift is south, following the streak of ore first encountered on the 1500-ft level, shows the strata to be about 12 ft in width. The face of the main southwest drift, on the 1500-ft level of the mine, is in a tough, heavy body of clay, strongly resembling the east wall of the Comstock vein in the Bullion and other mines. This clay body is full of cross-slips, and contains spots of fine white pulverized silica in considerable quantities, which, when struck with the pick, will almost instantly give way and run down like sand.

OPHIR.—Daily yield, 100 tons of ore. This ore is being extracted from the 1500 and 1600 ft levels. Only one mill is yet running on ore from the mine, but another, the Winfield, will be added in a very few days more. The repairs to the lower levels of the mine are progressing at all points as fast as it is possible for such work to be accomplished.

AMAZON AND GLASGOW.—The cross drift on the third station level is in a distance of 38 feet, at which point the east clay wall of the ledge was passed through and a fine vein of soft white ore encountered, highly charged with sulphurets of silver. The ore vein at this point has every appearance of being of great width, and will undoubtedly take some time to reach the west wall. On the levels above the pitch of the ore vein was to the west, but on this level, a depth of 469 feet below the croppings, the pitch of the ledge is strongly to the east, showing the ledge to be a true fissure, having the regular Comstock dip.

BELCHER.—Daily yield, 450 tons of ore. The ore stopes are all looking splendidly, and still runs high in gold. The mills are all kept steadily running on ore from the mine, and the yield of bullion for the month will fully equal, if not excel, that of last month.

NORTH CONSOLIDATED VIRGINIA.—Opening the 630-ft station is making excellent progress, the excavation being in 30 feet this morning, in perfectly dry ground. The mill is already taking some time to reach the west wall. On the levels above the pitch of the ore vein was to the west, but on this level, a depth of 469 feet below the croppings, the pitch of the ledge is strongly to the east, showing the ledge to be a true fissure, having the regular Comstock dip.

IMPERIAL-EMPIRE.—Daily yield, 20 to 25 tons of ore. This section is in the yield is showing entirely to the inability of the teams to haul the ore to the level. The ore breaks are looking well both north and south on the 1930-ft level.

LEO.—The face of the south drift from the bottom of the winze, 200 feet below the tunnel level, is in good milling ore. The east cross-cut on the same level is also in fair ore.

EMPIRE.—Judging from the general stratification in the present level, the width of the vein fissure will prove much wider than is figured upon, and important developments at a greater depth may be looked for.

BULLION.—The northeast drift on the 2000-ft level of the Imperial shaft is making the usual good progress, the face of the effort, cast running ground, interspersed with streaks of stringers, is lively looking quartz. The north drift on the 1700-ft level of the Imperial is steadily advancing, still following the west wall of the ore vein.

CALIFORNIA.—Sinking the C. & C. shaft is making steady and favorable progress, the bottom in good working ground. It is now down 1020 ft. The north drift on the 850-ft level is steadily advancing, the face still in ore of a very rich quality. This drift will connect to-day with the bottom of the winze being sunk below cross-cut No. 5 from the north drift on the 1050-ft level. This is about all the prospecting that is being done in the mine at present, and about all that can be added is, that the entire mine was never before in such a good condition as it is now.

YELLOW JACKET.—A cross-cut has been started east from the bottom of the south winze on the 1940-ft level, which is steadily advancing at a very favorable rate of speed.

LADY BRYAN.—Sinking the main shaft is making steady progress, the bottom still in ore giving good assays. The south drift on the 850-ft level is opening up finely.

SILVER OTTY.—Since last week's regular report a raise has been started about 300 ft from the mouth of the main adit tunnel, which is to-day some 25 ft above the track floor, and the top of it is in high grade ore. It will be pushed through to a connection with the ore stopes, and will undoubtedly take some time to reach the shaft or outlet for the ore from the stopes. A large amount of rich ore is accumulating on the dump.

SERRA NEVADA.—Sinking the new shaft is making excellent progress, the bottom in good working ground. The west drift at the 1260-ft station is making splendid progress.

KOSUTH.—The main south drift on the 850-ft level is steadily advancing to the southward, the face in a fine quality of white quartz and low grade ore. The north and south drifts from the main west cross-cut on the 600-ft level are steadily advancing along the ledge, for the purpose of draining the water before attempting to cross-cut the ledge.

BUCKETT.—The incline is sunk to a depth of about 7 ft below the 650-ft station, and will be continued far enough to make a 12-ft sump, or well room for water. To-morrow a main drift will be started for the ledge from this station. A large amount of water has been met with at the bottom of the incline thus far, but the pump now handles it with ease.

WEBSTER.—This mine is located just south of and adjoining the Kosuth. The croppings are large and the surface indications are excellent. A good working shaft is being sunk, and a fine, commodious hoisting works building, blacksmith and carpenter shops are being erected.

DATRON.—The north and south drifts on the 500-ft level are steadily advancing, each running parallel with the ore vein. The south drift on the third station level is also steadily advancing toward the Kosuth line.

LADY WASHINGTON.—The cutting out and timbering for the tank at the 530-ft station is completed, and the tank is now in progress of construction. Meanwhile, the pump sections for the second plunger are being lowered into position.

ETROPA.—Work has been suspended in both the north and south drifts on the 320-ft level almost the entire week, pending some necessary repairs to the hoisting machinery.

SALE & NONCHES.—Sinking the north winze below the 240-ft level 100 ft north of the incline is making steady progress, the bottom in ledge material; it is now down 40 ft.

BEST & BELCHER.—After the extraction of water from the 1700-ft level the double winze connecting the 1500 and 1700-ft levels was found to have caved somewhat. The winze is now being thoroughly repaired and put in good working order preparatory to resuming work in the drifts on the lower levels.

CROWN POINT.—Daily yield, 350 tons of ore. The decrease in the yield is principally owing to the inability of the haulers to get it to the mills. There is no change in any of the ore-producing sections of the mine.

CALIFORNIA.—The pump bobs are in and ready to run at the 400-ft level, and the excavation for the pump station at the 800-ft level is nearly finished.

SILVER HILL.—The flow of water is gradually slackening in the face of the east drift on the fourth level, while it appears to increase in the bottom of the main incline. It begins to look as if the incline was draining the water from the level above.

MINN.—The putting in of stations and a ladder-way for the escape of men from the mine is making good progress. The shaft is now down 1,006 ft.

UNION CONA.—The south cross-drift from the upper tunnel is showing very fine and encouraging quartz and ledge material in the face.

GOULD & CURRY.—The repairs to the shaft are making steady progress. The water is drained from the 190-ft level, and it will not now be long before everything in and about the mine will again be in good running order, and prospecting resumed on the lower levels.

CHOLLAR POTOM.—Daily yield, 50 tons of ore. The south prospecting drifts on the 1250 and 1350-ft levels are steadily advancing. Sinking the new combination shaft is making excellent progress.

NEW YORK CONSOLIDATED.—The east and west prospecting drifts on the 800-ft level are both steadily advancing, in very favorable ledge material.

MEXICAN.—Work has been resumed on the 1455-ft level of the Ophir shaft. The winze below this level is being crowded steadily downward, the bottom in quartz and ore of a very hopeful character.

ORIGINAL GOLD HILL.—Ore extraction at the rate of 20 tons per day is going forward, the south ore body holding out and showing splendidly in the bread and stopes, as well as the raise in the north end of the body.

JUSTICE.—Nothing new in the ore stopes and breasts at the 400 and 600-ft levels; yielding as usual.

SOUTHERN COMSTOCK.—The cross-cut is now in 845 ft, with the face in very favorable vein material.

ROCKY MOUNTAIN.—Cross-cut has been started to determine the width and character of the ledge on the 650-ft level.

SAVAGE.—Opening the prospecting drifts on the 2000 and 2200-ft levels is steadily progressing.

SUPERIOR.—Situated in Crown Point ravine. Sinking a three-compartment working shaft, which is now down 18 ft.

SUCCESS.—The north prospecting drifts on the 550-ft level are steadily advancing, the ore and quartz in the face of the west drift showing favorable improvement.

COSMOPOLITAN.—Face of main north tunnel and the winze below the tunnel level, following the ledge, showing splendidly in ore which gives good assays.

EMPIRE.—Face of upper tunnel is a hard break of porphyry at present. Diamond drill now down 400 ft, and evidently nearing the east wall of the ledge.

NEVADA.—Main drift north in the ledge advancing well and showing well in low grade ore in its face, with streaks of porphyry, clay and quartz.

KNICKERBOCKER.—The pumps are kept steadily draining the flow of water, without showing signs of cessation, is still strong.

ELY DISTRICT.

REVIEW OF OPERATIONS.—*Ploche Record*, Jan. 23: During the past week mining matters have taken a start that will prove to outside camps and to San Francisco that Ploche is still in the field, steady and staunch. The development of the mine will have a tendency to immediately start prospecting in the mines over the Divide, such as the Portland, Excelsior and others, in addition to which there are numerous mines not known to us by name that the owners will now be anxious to develop, and will use their best endeavors to do. The bullion shipments during the past week have amounted to \$45,512, a large increase over an previous week for nearly a year. The Raymond and Ely mine has made a rich strike on the 1000-ft level, and have pumped their shaft dry, so that sinking is now progressing rapidly. Piochers can now congratulate themselves that the worst of matters are about over, and that Ploche from this time forth will show itself as being the second camp in the State of Nevada.

The past week's development of the mine have been made in the Alps mine. In the cross-cut on the 160-ft level an important strike has been made, consisting of a gold quartz ledge of a width of two feet, the quartz on being pulverized showing fine specimens of free gold. Assays of this ledge show it to be worth \$7,385.07 per ton. Outside of this development work is being done on other portions of the mine night and day, and fine ore is being hoisted to the surface and shipped to the Floral mill to the amount of about twelve to fifteen tons daily. Mr. Blair is at present laying aside the gold quartz from the cross-cut, as the mill has all it can do to work the other ore extracted daily.

Pulp assays \$140.—On Monday night the pump of the Raymond & Ely mine succeeded in draining the shaft dry, so that on Tuesday extra pump rods were placed in position and sinking was commenced again with extraordinary vigor. Since that time the pump has kept the shaft in a dry state so that the progress in the work of sinking is not interfered with, and before long we are in hopes of chronicling a fine development of ore below the water level. A very rich strike was made on the 1000-ft level, which grew better daily.

In the Meadow Valley mine there is no general change to report. The work continues as usual on the 1200-ft

Silver Coin.

The enormous yield of the bonanza mines, and the certainty that they will be made to produce so many millions of dollars in silver monthly, and that the nature of money compels the owners of it to seek or create opportunities at once for its active and constant employment, makes the status of silver, as a commercial factor, an interesting subject. Gold being the standard, the price for refined silver is regulated in the United States by quotations from the London market, and Congress has vested authority in the Secretary of the Treasury to dictate what rates shall be paid at the mints. The current price is \$1.20½ per ounce. The action of Germany in demonetizing silver had the effect of diminishing its value considerably. If Senator Sargent's bill to make it equal to gold for any payment not exceeding twenty dollars should become a law, as it ought to, its ultimate effect will be the creation of a vigorous demand at home that will serve as a good outlet for any surplus.

If in the daily commercial transactions of our 40,000,000 of population one person in twenty-five should use twenty dollars in silver, and each twenty dollars were made to do quadruple duty in passing from hand to hand, it would require \$50,000,000 to meet the demand for constant circulation. The probability is that three times that sum will be thus used in the United States when the provisions of the act of Congress of 1873, as amended in 1875, providing for the redemption of the fractional currency in subsidiary silver coin, have been complied with. The fractional currency now afloat amounts to about \$32,000,000. The whole amount issued was \$50,000,000, but \$18,000,000 have already been retired and destroyed, and the Secretary of the Treasury, who was vested by the act of Congress with discretionary power, has already caused \$9,000,000 of the smaller silver coins to be hoarded at the mints preparatory to redeeming the remainder, which will no doubt all be retired as soon as the accumulations are sufficient for the purpose, and the currency conditions enable the Secretary to protect the Government against speculative combinations. If it be true that the \$10,000,000 in silver bullion proposed to be exhibited at the Centennial Exhibition, in proof of the wonderful monthly capacity of the famous Nevada mines, will be purchased by the Government, the fractional currency will probably be all called in at least a year sooner in consequence.

While the above estimate of \$150,000,000 in silver for current business transactions in the United States is a fair one, it may well be that double the amount will be used. The practice of hiding money is very widespread. It is common in Mexico, and is the notorious custom in India and China. The readiness with which France paid the indemnity of \$1,000,000,000 was owing in a great measure to this habit, and a little reflection will show that the exercise of it will prevent silver from ever becoming inordinately cheap, no matter how generously the bonanza mines may supply it. In China and India, for instance, there are 600,000,000 of population. Allowing four to a family there are 125,000,000 of families, and if each family hoards away only five dollars a year the annual disappearance in this manner would foot up \$625,000,000. This accounts naturally for the absorption of silver into the Orient, which so many writers have considered as a mysterious fact. Silver is held in high repute there. In 1864, during a financial crisis in Calcutta, it was found impossible to raise even a single rupee on \$100,000 in gold.

If Senator Sargent's bill, above referred to, becomes a law, and the condition of relative values justifies the Secretary of the Treasury in substituting subsidiary silver coin for the fractional currency at an early day, the whole country will be the gainer.

Sangre de Cristo and its Mines.

In the Sangre de Cristo range, about three miles north of Abeyta pass, are what are known as the Grayback diggings. There are at present several men at work, all of them working on one mine, the main lead of the camp.

This one lead is showing up very well now. A gentleman informs us that he was shown a specimen of quartz, claimed to be taken from it, that was really the finest gold bearing quartz he had seen in Colorado. It showed great pieces of scale gold all over it.

These mines are among the oldest in this part of the Territory. They were worked by the soldiers a number of years ago. They have not been developed, however, to any great extent. But as they now seem to be showing up more encouragingly, there is hope of the place becoming quite a camp.

Not far distant from the above mines are some placer claims which a few men have persistently worked for several years. They have steadily taken out gold, but on account of lack of water and other facilities, it has been in rather small quantities, not reaching a maximum of more than two dollars and a half per day. But, knowing that the gold is there, they still work.

A ditch has been run from the Sangre de Cristo creek, in Abeyta pass, to supply them with water. It is a number of miles in length, and quite a herculean task for a handful of miners to undertake, but they expect to complete it in the spring, and then they will reap the reward of their perseverance and labor in the gold that will be taken out.

The mines above Mosca pass, near where

Mr. Bowman's mill has been erected, from all accounts are in a very prosperous condition. Those who have visited them lately, have been very much encouraged by their appearance, and a number have gone to work to develop their individual mines.

The mill is about ready to start, and unless the ice interferes will be started up, and a considerable quantity of ore milled before spring. Mr. Bowman has labored very persistently, and under great difficulties, and deserves success. His mill will be the means of either proving the district a failure, or else opening it up as a rich mining camp, and we look for the result of his labors with much anticipation, and hope and believe that the running of the mill will demonstrate this to be one of the best gold mining camps in the Territory.—*San Juan (Col.) Prospector.*

Bees in San Diego.

In the course of an able article describing the various interests of San Diego county, the *World* of January 8th prints the following paragraph concerning the honey interest:

The narrow canons and bleak hills of San Diego county that used to be held in derision by the upper country, have proven themselves to be productive of a wealth that places them fairly on a level with the agricultural portions of the State. No matter how steep the hillside, or how gloomy and dark the canon, the nimble winged bee in its busy search for the sweet stores that nature has hid within the bosom of the flower, regards it not, but flits from place to place and gathers its rich store, and lays it away for the benefit of its master, man. The business of bee culture has continued to increase with great rapidity, and in every instance when a person understands the business and will devote his time and attention to it, it has proven profitable.

The following table will show the increase in the business for the last four years:

Year.	No. of Hives
1872.....	1,136
1873.....	1,854
1874.....	2,493
1875.....	8,761

The yield of honey, while very fair, has not been as great as it would have been had the bees been allowed to work where they were swarmed, but a large number of our bee men devoted their attention to the production of bees rather than of honey, and the moving of the swarms to new localities, of course interfered with the working of the bees to a great extent, but notwithstanding these drawbacks, the yield of honey the past year will probably reach 400,000 pounds. Of this amount 307,000 pounds have already been shipped by steamer. There have been manufactured by our two planing mills 16,700 hives; there has been used 800,000 feet of lumber. In addition to this nearly 200,000 feet of cut lumber for hives and honey cases has been imported.

SMOKE PREVENTER.—A new fuel-saver and smoke preventer, as it is called, was first shown in public in Cincinnati the other day. The principle on which it acts is as follows: A current of air is forced by means of either a syphon or a fan through distributing pipes, three in number. The first of these pipes is located in front and under the grate bars, thus forcing the air through the grate. The second pipe is placed above the fire-door, blowing the air into the fire. The third is on the bridge wall, blowing the air forward. The three pipes combined entirely prevent the formation of smoke. It is claimed for this invention that it can be successfully applied to steamships, steamboats, locomotives and even to stoves.

A DISASTROUS EXPERIMENT.—That was a very foolish and disastrous experiment which S. K. Kidder of Iowa Hill tried last week. Kidder, says the *Placer Argus*, owned a valuable gravel mine near Iowa Hill and it seems that some one had been trying to rob the sluicines. In consequence the watchman had strict orders to shoot any one caught prowling around the premises. About two o'clock Kidder arose, and it is supposed went to the mine to see if the watchman was attending to his duty. It seems that he was, for the unfortunate man was shot through the head and instantly killed. Kidder was a man of middle age and leaves no family.

THE FIRST OF ITS KIND.—The legislature of Minnesota passed a law for the erection of a State inebriate asylum, the expenses of which are to be borne by a tax upon the liquor sellers. An appeal was made from the provisions of the law and the case taken to the supreme court, where its validity was confirmed. It is said that \$10,000 of the tax have already been collected, which it is expected will be increased to \$30,000 by the first of July. This is the first act of the kind, we believe, ever adopted by any of the States, and is well worthy of being introduced into every State in the union.

Rich copper deposits have been recently discovered in the Walker river section, about forty miles south and east of Virginia. The ledge is from five to twenty feet wide, and \$50,000 worth of ore has been already taken out. The ore is easily worked, and the cost of extracting it and getting it to market is but one cent a pound.

The direct exports of coal from Seattle during the year just closed aggregate for the three companies 70,157 tons. Of this quantity the Seattle company alone shipped 56,887 tons, the Renton company 10,456 tons, and the Talbot company 2,814 tons.

How Milk is Secreted.

In his address before the Pennsylvania dairy-men's association, Prof. L. B. Arnold gave a description and illustration of a fully developed udder in its active state, showing it to be divided into four separate glands, each acting independently of the other, but all bound together by elastic membranes and suspended and supported by one compound tendon connected with the abdominal muscles, and ramifying in minute filamentary divisions which fasten into every part of each division of the udder, and also into the skin which covers it, so that it is well supported, even when heavily laden with milk. Milk, he said, is not contained in the udder in one capacious sack, as many people suppose, and as some authors have represented, but in small reservoirs distributed through the glands. The largest of these reservoirs is at the top of the teat, which, as was shown by an illustration recently copied from a fully developed udder four weeks from the time of calving, was only about the size of a turkey's egg. The other cavities distributed through the glands varied from the size of a hickory nut to a pin-head, the largest and greatest number being located at and near the lower part of the udder, diminishing in number and size upward. The reservoirs in each quarter of the bag are cemented by a set of tubes distinct from the other quarter, which run like blood-vessels by crooked routes from one reservoir to another, till they at last connect with the larger cavity at the top of the teat. In each quarter of the udder all the internal arrangements and subdivisions of the glands are not only independent of but different from the corresponding divisions in the other quarters. The reservoirs and tubes in no two quarters are alike, either in size, location or number.

Tapestry.

In early English mansions the walls of apartments were usually covered with tapestry. In those days there were not so many broad plain surfaces on the walls, and the rooms were lower than now. There was more wood work; large ornamental fire-places, dados, cornices and window recesses occupied much of the walls, and they were often entirely or partly paneled in oak. The furniture was massive, while trophies of the chase and the battle-field held a prominent position, and tapestry completed the mural decoration. That the wall was beautifully painted seems probable, for the number of churches having mural paintings is so great that a list of such has been published by the science and art departments of South Kensington. These specimens of wall painting have been, for the most part, discovered under many coats of color after ages of neglect.

Tapestry weaving is said to have been introduced into England in the time of Henry VIII. by William Sheldon, who brought workmen from Flanders about 1540; but probably the art was merely revived at that period, for so early as 1302, Lord Arundel bequeathed to his wife Philippa the hangings in his hall recently made in London. However, tapestry seems to have been brought to great perfection in the middle of the sixteenth century, and about that time were not uncommon in the houses of the middle classes.

Stamped, painted and gilded leather has long been in use as a wall decoration. It is said to have been invented by the Spaniards, though introduced into England by the Flemings in the reign of Henry VIII.

The tunnel of the Virginia City and Gold Hill water company, near Marlette Lake, in the Sierra Nevada, will, when completed, be 5,000 feet long. At present work is being done on both ends of it, and a distance of 1,200 feet has been excavated. The progress is at the rate of sixty-five feet per week. The rock now is hard, but it is easy drifting compared with that which had to be done soon after starting at the western end of the tunnel. At this point a crevice in the rock five feet in width was struck, through which quicksand rushed with the rapidity and violence of water, completely filling up the tunnel, and it took sixty-eight days to get past this awkward little gap in the granite. At the eastern end a similar crevice was encountered, two feet and a half in width, which it took fifty days to pass.

It is stated that gold in large quantities has been found in Mariposa creek, about twelve miles above Placerville. A great many are engaged in placer mining there, and are averaging from four to five dollars per day, per man. It is thought this gold was brought down from the mountains by the late heavy rains, and that it comes from some rich mine which has never been discovered.

J. M. HITCHINGS, of Yosemite, has discovered in the headwaters of Kern river, 10,500 feet above the sea, a new and beautiful fish, which he named the "golden trout." Its color was like that of the gold fish, but richer, and dotted with black spots a quarter of an inch in diameter and has a black band along its sides.

EXTENSIVE preparations are being made to mine on Feather river, near Oroville, the coming summer, where it is known that gold exists in large quantities, the only difficulty in obtaining it thus far being that of keeping the mines free from water.

House Building.

One of the most readable articles in *Scribner's Magazine*, for January, is contributed by John Burroughs, who takes a very common sense view of the subject he discusses. He looks at the house also with the eye of the true artist, recognizing all the accessories to beauty contributed freely by nature, rocks, trees, hills, waters, and desires that in its construction and color it shall harmonize with these. He says: "If one's house existed for its own sake, if it were an end in and of itself, there might be some fitness in the attempt to give it positive beauty. But as the matter stands, only that human habitation satisfies my eye in which the aim of beauty or art as such is entirely swallowed up and lost sight of in the suggestion of comfort, warmth, stability, and I do not think that the house is beautiful, but inviting and home-like. If the builder has added any intrinsic ornaments, anything not in keeping with the necessities of the construction (of course I would not confine him to the bare bones of the case); if he has clapped on an abominable French roof, which, in our climate, answers so poorly the purposes of a roof, and suggests no shelter or hospitality; if he has thrust up a tower where there is no view to command; or if he has painted his structure one of those light, delicate tints, that is like nothing out of doors, and makes one feel as if the house ought to be taken in out of the wet and the weather. I see he has made a bid for the admiration of the public, and that he had no deep want in his heart to satisfy."

Further on, he says: "What is a man's house but his nest, and why should it not be nest-like both outside and in—coarse, strong, negative in tone externally, and snug and well feathered and modeled by the heart within? Why should he set on a hill, when he can command a nook under the hill or on its side? Why should it look like an observatory, when it is a conservatory and dormitory? The domestic spirit is quiet, informal, unceremonious, loves ease, privacy, low tones; the chimney corner, the old arm-chair, the undress garb, the homely cares, children, simple pleasure, etc.; and why should it, when it seeks to house itself from the weather, aim at the formal, the showy, the architectural, the external, the superfluous? Let state edifices look stately! but the private dwelling should express privacy and coziness. But every man's house is in some sort an effigy of himself. It is not the snails and shell-fish alone that excrete their tenements, but man as well. When you seriously build a house, you make public proclamation of your taste and manners, or your want of these. If the domestic instinct is strong in you, and if you have humility and simplicity, they will show very plainly in your dwelling; if you have the opposite of those, false pride or a petty ambition, or coldness and exclusiveness, they will show also. A man seldom builds better than he knows, when he assumes to know any thing about it."

Arizona Mining Items.

The Arizona *Citizen* has the following items: David Shultes was in Tucson last Saturday, from the Quacharty, where he is mining on quite a liberal scale for one of limited means. He is working at a depth of thirty-five feet, and is also having an incline run on a contract. In all he has sixteen men at work mining and now melting, at least he expects his blower from Phenix on his return. He hopes to soon increase his force to forty men. The mine looks well and every feature makes prosperous showing. Most of the ore shows horn silver.

Andrew Storrar has three men at work on the Sacaton—a galena and silver mine; and two men are taking rich gold ore from Ford's mine and are about ready to work it in arastra; miners are also opening up the Gray Eagle, as well as other mines in Quacharty district. A prosperous year is anticipated in that part of Pinal county.

Very favorable news has been lately received from the French mine. Discoveries of old works not hitherto known to the present claimants have been made, and the extent of valuable ore seems to enlarge as work progresses.

Mr. J. L. Darrah, one of the old mine claimants, recently returned from California, whither he had been to get married and attend to other very sensible business. He now goes to take charge of the old mine, which he regards as one of the best, notwithstanding his extensive mining experience.

We have no report from several districts this week, yet we know many men are at work with encouraging results.

We hear some little water was accumulated in the Santa Rita placers during the recent rains, and more will soon be, else all signs will fail.

The mining enterprises are as yet conducted mainly by men of muscle and determination to succeed and they will succeed, and have valuable property soon.

THE JUDN & CROSBY WORKS, since the burning of Stewart's mill, have had a full supply of ore and are producing as much bullion as the two works turned out previously. This shows that for the present there is enough room for only one custom works in that town (of the amalgamation class.) Two years hence two can find an abundance of material, but not now.—*Colorado Mining Review.*

THE Pensacola, Admiral Almy's flagship, has arrived here from a year's cruise.

USEFUL INFORMATION.

ANILINE PENCILS, COPYING PENCILS, ETC.—These new pencils are announced at the same time both in Paris and Berlin. The French pencils are made in Paris, according to the hardness, very much like common lead pencils. The materials used are aniline, graphite and kaolin, in different proportions. Made into a paste in cold water, they are pressed through a screen that divides the mass into the slender sticks used in filling the pencils. When dry the sticks are fitted to the wooden parts, and these are glued together very much in the usual way. They may be used in copying, marking in permanent color and in reproducing writing or designs. In copying, a thin sheet of moistened paper is laid over the letters, design or document, and the lines are traced with the pencils. The action of the water on the aniline gives a deep, fast tracing, resembling ink in color. The German makers also employ aniline in the manufacture of these pencils. On ordinary dry paper they give a well-defined mark that cannot be removed by india rubber. When the paper is dampened with water the markings assume the appearance of ink. These pencils may also be used for copying purposes, as when moistened sheets are laid over the writing, under a slight pressure, they will transfer good impressions that do not blur and that resemble the original in every respect. —*Scribner.*

MUCILAGE FOR MINERALS, ETC.—Mr. F. C. Hill, of the geological museum, Princeton, N. J., writes to the *Journal of Pharmacy* as follows: "My friend, Professor R. P. Whitfield, of Albany, N. Y., was good enough to give me the following recipe for macilage to mend fossils and minerals, and, after several months of experience with it in the museum, I find it so valuable that, with his permission, I send it for the benefit of the readers of your journal:

Starch.....2 dr.
White Sugar.....1 oz.
Gum Arabic.....2 dr.
Water.....q. s.

"Dissolve the gum, add the sugar, and boil until the starch is cooked. Professor Whitfield is in the habit of drying it into sheets, on paper, and re-dissolving when wanted. He does not claim to have originated the recipe, but thinks it is one of the compositions offered to the United States government for gumming stamps. It is certainly a very adhesive mucilage, and, owing to the sugar, never becomes brittle; so that it never scales off, as most glues do, from stones or other hard substances. In a geological cabinet it is simply invaluable."

PRESERVING OF HOPS.—A newly patented method of keeping hops employs carbonic acid as a preservative agent. Air tight, tin lined boxes are loosely filled with hops. Carbonic acid (made in a soda fountain machine by the usual sulphuric acid and marble dust process) is then admitted to the box through a tube that reaches to the bottom. The gas fills the box, driving the air out before it as it rises from the bottom. The hops are then compressed, and more filled in with an additional supply of gas. This is repeated till the box is loaded with pressed hops saturated with carbonic acid. The cover is put on, and more gas is added under pressure to drive out the last trace of air, and then the box is quickly sealed hermetically. The first experiments in this direction proved entirely successful.

A RULE WORTH REMEMBERING.—Here is a rule which will hold good for all dates in the present century since 1852, as well as for those in the present year. In order to find out the day of the week upon which any event fell one hundred years ago, count forward two days from the day of the week upon which the Centennial anniversary falls. For instance, the 4th of July, 1876, will fall on Tuesday; the 4th of July, 1776, was Thursday. The Centennial anniversary of the battle of Bunker Hill was celebrated Thursday, June 17th, 1875. The battle was fought Saturday, June 17th, 1775. This rule must not be used for dates in the eighteenth century earlier than 1752, because that was the year when the change from "old style" took effect in England and her colonies.

CLEANING WATER MAINS.—It frequently happens in iron water mains that deposits of rust are formed, sufficiently thick to reduce materially the diameter of the pipe. To clean the interior, Mr. E. Dodds, an English engineer, has lately devised a pipe scraper, which operates as follows: The pipe is cut, the scraper is inserted, temporary joints are made, and the water is turned on at highest pressure, which drives the scraper on at great speed. In the first experiment, a distance of 300 yards of pipe was thoroughly cleaned in two minutes and 20 seconds.

THE EAR OF A FISH, almost always entirely within the cranium, on the side of the brain, consists essentially of a vestibule and three semi-circular canals, which receive the vibrations of the integuments and cranial walls; there is rarely anything that can be called an external ear, drum, or tympanic cavity; loud, sudden, and strange sounds frighten fish; in ancient, and even in modern times, they have been taught to come and receive food at the tinkle of a bell, or the pronunciation of pet names.

An alloy for locomotive whistle which will give a clear sound is made of copper, eighty parts, tin, eighteen, antimony, two.

AIR COOLER. To reduce the temperature in a factory in Paris, recourse was had to an inexpensive form of air cooler. A thin plate of metal, perforated with holes one-tenth of an inch in diameter, and having a total area equal to one-ninth of the surface of the plate, was set at a slight angle in a tight box. Over this plate a thin sheet of water at a temperature of 55 Fahr. was allowed to flow steadily, and by means of a power blower air was forced into the box below the plate. By its pressure the air forced its way through the holes in the plate and through the water, and was then led by pipes to all parts of the factory. By this device, the air in the room was reduced to 57° Fahr., or within four degrees of the temperature of the water. Other experiments gave varying results according to the initial temperature of the water, but in each case the apparatus reduced the temperature of the current of air to within seven degrees of that of the water. Steam power is required for the blower, and, for the best results, the supply of water must be abundant and its temperature low. The application of this device might, in our warm climates, prove of use in pork packing and other industries where a low temperature is desirable. —*Scribner.*

POISONOUS POTATOES.—The sprouts of the potato when analyzed are found to contain a vegetable alkaloid called by chemists *solanine*, which is very poisonous. Solanine is obtained from various species of solanum genus of plants comprehending the potato, tomato, nightshade, etc. This alkaloid does not exist in the tubers unless they are exposed to the light and air. If potatoes remain for any length of time after having been dug too bright a light, or if the earth is accidentally removed from them in cultivation, they are changed by the chemical action of light and become green in color, which is owing to the presence of solanine. Potatoes of a blackish-green tint are good for seed, and it is claimed by some that the poison they contain is a sure preventive of decay, but they should never be cooked for the table. If they are boiled in a large quantity of water and the water carefully drained off, they may be fed to stock. —*Ec.*

OIL PAINT FOR FLOORS.—None but earth colors should be used in painting floors, and the rapid wearing off of a coating of oil paint on a floor is a sure indication that white lead has been mixed with the paint. This is generally the case, since it causes the paint to cover better and spread easier. Even the employment of a varnish that has been boiled with borate of manganese preferred. It is also very important that the first coating should be perfectly dry before a second is laid on.

WATER-PROOF DRESSING FOR LEATHER.—A dressing for rendering leather water-proof, made as follows, as proposed by Hager, has been found to answer the purpose: dissolve one part of india rubber in five parts of illuminating petroleum, by digestion for a day, and add twenty parts of paraffine to the paste mass and digest again for half a day, with repeated stirring, and then mix it with five parts of oil and five of tallow, and finally add ten of petroleum, or enough to give the mass the consistency of butter.

GOOD HEALTH.

VENTILATION OF CLOTHES CLOSETS.—Too little attention is paid in the construction of closets to their proper ventilation. It is not always convenient to have a closet door stand open, and if it were, full ventilation cannot be secured in this way. There should be a window or an opening of some sort from the closet to the outer air or to a hall, so that a current of air might remove any unpleasant odors arising from clothing that has been worn, from shoes, or from anything else kept in the closet. A garment that has hung for a length of time in a close closet is as unfit to wear, unless it has been thoroughly aired, as though the unwholesome vapors it had absorbed were visible to the eye. The charm of clothing new and clean lies far more in the absence of these vapors than many people are aware.

A WHISKY DIET.—The *Baltimore American* reports that the board of visitors of the jail in that city have assented to the testing of a novel and interesting experiment that is expected by those urging it to result in the radical cure of the insatiable thirst for strong drink. A number of the hardest cases, who yearn for the trial, are to be placed by themselves, and supplied with no article of food or drink that is not flavored with whisky. Coffee, bread, meat—in short, everything is to have a dash of whisky. It is believed that, in a few weeks, the tramps will become so disgusted that they will loathe the very sight of liquor, and thus cured of the degrading appetite, they may be restored to manhood, self respect and usefulness.

WHEN TO TAKE A WARM BATH.—A warm bath should be taken at night just before retiring, and if the system is weak the bed and sleeping room should be warm to prevent taking cold. Very few persons can take a warm bath in the daytime and go out into the air and attend to ordinary business without much peril.

Prevention of Chilblains.

MESSRS. EDITORS:—Appropriate to the season I send you a few lines for the "Good Health" column. As the minor miseries go very far to make up the grand total of human suffering, he who alleviates a single one of them does some good in his day and generation. Any one troubled with chilblains, which is no small grievance, who will pursue the following directions will find it worth a year's subscription to the *PRESS*.

Some thirty years ago a matronly old lady directed me, for this complaint, to put my feet into half a bucket of cold water containing a half ounce of borax dissolved therein.

The relief was very satisfactory, and three or four repetitions during the winter kept me completely free from the tormenting affliction. I afterwards omitted the borax and the result was the same. Should the plain water be too simple and cheap, one might put in five grains of morphia or ten drops of tincture of belladonna, or stramonium, or aconite, for their narcotic effect, or five grains each of acetate of lead and sulphate of zinc for their cooling and astringent effect, or a little hydrate of chloral (that's the fashion) for its—well, for some kind of an effect. None of these in small quantities will do any harm—nor any good. The water needs no adjunct; it will do the whole business.

The philosophy is this: Persons so afflicted are those of loose muscular fiber, and the cold water contracts the capillary vessels, and gives them tone to resist their engorgement. Where heart or lung disease exists the temperature of the water should not be below sixty deg. Fah.

W. T.
Bingham, Utah.

POISONING BY A LAMP SHADE.—At a recent meeting of the medical society in Bonn, Professor Zuntz brought forward a case in which a gentleman who had for several years been subject to migraine observed that for some days he had headache late in the evening, which, without interfering with sleep, continued in the morning, and was accompanied with loss of appetite and malaise. In about a fortnight the symptoms became more severe and lasted the whole day. At the same time similar symptoms, but much less severe, appeared in two students who sat at the same table in the evening. The green shade of the petroleum lamp was suspected of being the cause of the mischief, and on chemical examination it was found to contain arsenic. Its use being discontinued all the symptoms ceased in the three individuals. It was evident that the heat of the lamp had set free the arsenic, and the greater severity of the symptoms in the first mentioned individual was due to the fact that he was near sighted, and therefore sat nearer the lamp than the others did. Professor Zuntz said that he himself was some years affected in a similar way, though less severely, while using a green lamp shade, in which arsenic was found.

DEATH FROM TIGHT LACING.—There has just died at Pimlico, Mrs. Kezia Wheeler, an old lady at the age of 77, on whom an inquest has been held. Mrs. Wheeler was found dead in her bedroom on Sunday morning last, dressed for church, and with her Bible in her hand, having apparently expired suddenly. The surgeon said death had resulted from the bursting of an aneurism, and the post-mortem examination revealed terrible evidences of tight lacing on the part of the deceased, who had been a very beautiful woman. In fact, one end of the old lady's ribs had been pressed against the internal organs, and had kept them constantly at half action, as it were, until apparently an aneurism was produced by the sudden rupture of which she died. Mrs. Wheeler must have been an exceptionally healthy woman to have thus lived in spite of the corset which imprisoned part of her organs and interfered with their natural development; had she not laced she would doubtless have been a centenarian. —*London Daily Telegraph.*

STARVED TO DEATH.—The *New Haven Journal* says: "A strange and painful fate was Police-man John Benson's, who died on Thursday in Norwich, at the age of sixty-eight. For three months he had suffered from a cancer on the tongue—possibly a result of too much smoking. For two months past the tongue has been so swollen and sore as to absolutely prevent all eating, and the sufferer was kept alive by semi-liquid food given by means of a tube. During the past ten or twelve days it has been almost impossible even to introduce this tube, so bad was the cancer growing, and for four or five days before his death the poor man was literally starving to death. The immediate cause of death was pronounced to be starvation. His relatives and friends, aware of the fate which was coming to him, stood powerless to avert it. Thousands will remember Mr. Benson as the excellent and efficient manager of the police every summer at the Willimantic camp-meetings."

CHAPPED HANDS.—The easiest and simplest remedy is found in every one's kitchen closet, and is nothing more than common starch. Reduce it to an impalpable powder, put it in a muslin bag, keep it in the table drawer. Whenever you take your hands out of dish water or suds, wipe them dry with a soft towel, and while yet damp shake the starch bag all over them and rub it in.

DOMESTIC ECONOMY.

Choice Treatment of Food.

In the choice of foods we cannot exercise too much care. It is cheaper to procure only the very best articles. All vegetables and fruits should be grown on the best soils, and the fertilizers used should be well decomposed and not fresh and rank. Partially decayed food of whatever kind should be avoided. For breads, the best white wheat is none too good. If grown in new soil it is likely to be better and to contain abundance of the mineral matter so needful to health. Fruits for eating without cooking should be ripe, tender and not too tart; while those for cooking may be either sweet or sour, but they must possess the peculiar quality of retaining when cooked their best flavors. Potatoes should be fresh and ripe—old ones are less wholesome, especially when they have been exposed to the light and air, and braised by much handling, or long exposed to cold.

Animal food should be chosen with great caution. Only healthy animals should be used for eating. They should be neither too old nor too young, too fat nor too lean. In butchering, all the blood should be removed from the body, as otherwise the flesh putrefies readily. It should be thoroughly cooled before eating. It is also desirable that the animal be not killed for several hours after eating or after fatigue. The long journeys animals are sent on crowded, filthy cars, render their flesh unwholesome.

The treatment of animal food is a matter of importance. Why do we cook it at all? First, to render it more pleasing to the sight; second, to develop its best flavor; and third, to render it digestible and palatable. Flesh cooked too much is rendered innutritious and indigestible; if cooked too little, it is disagreeable eating. Liebig said he would never have flesh subjected to a higher temperature than 170 degs. Fah., except for a few minutes after it is put into the pot, when it may be submitted to a temperature of boiling water in order to coagulate the albumen into a sort of crust on the outside to hold in the flavors that might otherwise be evaporated. In roasting meat, also, let the heat at first be high, and gradually decrease to the boiling point for the same reason. Stewed meats are more wholesome and nutritious than any other. The process renders flesh tender and succulent and easy of digestion.

The Origin of Pumpkin Pies.

The pumpkin pie is considered a parody American dainty, and ample justice is done it at each annual return of the holidays. It is to be hoped the institution will lose none of its patriotism and favor, and that the digestion of its lovers will not suffer when they discover that this specialty of the Yankee, in which he, or, more properly speaking, she—for the wife is the concocter—takes pride, is no American specialty after all, but existed in England two hundred years ago, and is to be found in "The Complete Cook," published in 1655.

The English pie is a much more elaborate affair than that of the Yankee, and contains more ingredients. As the season of good things is now at hand, when novelties of this kind generally prove acceptable, we give the recipe, which is so old, it can, like the dresses worn at the same period, be introduced to this generation and called new:

"To Make Pumpkin Pie.—Take about half a pound of pumpkin and stew it; a handful of thyme, a little rosemary, parsley, and sweet marjoram slipped off the stalk, and chop them small; then take cinnamon, nutmeg, pepper, and six cloves, and beat them; take ten eggs and beat them; then mix them and beat them altogether, and put in as much sugar as you think fit; then fry them like a froize; after it is fried let it stand till it be cold, then fill your pie; take sliced apples thin, round ways, and lay a row of the froize and layer of apples, with carraways betwixt them while your pie is filled, and put in a good deal of sweet butter before you close it; when the pie is baked, take six yolks of eggs and some white wine of verjuice (ver-juice,) and make a candio of this, but not too thick; cat up the lid and put it in; stir them well together until the eggs and pumpions be not perceived, and serve it up."

Now, any lady adventurous enough to try this pie can call it by a French name and give a dinner party to introduce it.

OATMEAL AND COCOANUT.—Oatmeal mixed with grated cocoanut produces a very attractive cake to both old and young. Take three heaping teaspoonfuls of grated cocoanut, or two of the prepared desiccated cocoanut; add to it half a pint of the finest oatmeal and two heaping teaspoonfuls of sugar; stir it into one gill of boiling water, and mix it thoroughly together; turn out on the rolling board, well floured, and roll it as thin and cut out as for common crackers; put a bit of citron and a half dozen currants into each cake, sticking them into the dough. Bake in a slow oven and watch carefully lest they brown a shade too deep. To make them crispy let them stand a day in an uncovered dish.

GRAHAM FLOUR PUTTS.—One quart of sweet milk, two eggs, flour to make in a thin batter, fill the gem cups two-thirds full, bake in a quick oven.

MINING SCIENTIFIC PRESS

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DEWEY & CO., Publishers.

A. T. DEWEY, GEO. H. STRONG
W. B. EWER, JNO. L. BOONE

Office, No. 224 Sansome St., S. E. Corner
of California St., San Francisco.

Subscription and Advertising Rates:
ADVERTISING RATES.—1 week, 1 month, 3 months, 1 year.
Per line.....25 .80 2.00 5.00
One-half inch.....1.00 3.00 7.50 24.00
One inch.....1.50 4.00 12.00 40.00

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THE ORIGINAL ARTICLES in this paper are mostly set in solid type, giving in our columns one-third more reading than is contained in ordinary leaded matter.

San Francisco:

Saturday Morning, Feb 5, 1876.

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NEW ADVERTISEMENTS.

Miner and Hoisting Engines, Treadwell & Co., S. F.; Ore Crusher and Pulverizer, F. Alden, Pittsburgh, Pa.; Iron Pipe, Treadwell & Co., S. F.; Occidental Foundry, Steiger & Kerr, S. F.; Scroll Saws and Lathes, W. E. and John Barnes, Rockford, Ill.; Cherokee Flat Mining Company—Sale of Delinquent Stock; Eureka Stone Company—Assessment Notice.

On the Ophir mine the east drift on the 1100-foot level is steadily advancing, the face in quartz and low grade ore, the prospects becoming more and more encouraging as the drift advances. It will be remembered that this drift is running into the east country, and is in entirely virgin ground, all the former prospecting on the upper levels of the mine having been done to the westward of the shaft. The belief is steadily gaining ground that the drift will yet cut the top of a portion of the great bonanza ore body.

MESSES. DEFREES & CLARK have established works in this city for the manufacture of bicarbonate of soda from the native soda of Nevada. They have just turned out the first batch of a few tons, which the wholesale dealers in the article pronounce excellent. They propose making all sorts of chemicals in addition.

COINAGE.—The U. S. mint, in this city, made the following coinage in January: Gold—double eagles, \$1,940,000, 97,000 pieces. Silver—trade dollars, \$342,000, 342,000 pieces; dimes, \$275,000, 2,750,000 pieces. Total, \$3,617,000; 3,092,000 pieces. Grand total, \$2,557,000; pieces, 3,189,000.

The Mining Season.

Although the late heavy falls of snow in the mountains have been of great inconvenience to railroad operations, they are a cause of great congratulation to the miners. Throughout the gravel mining regions a copious supply of water has been running for nearly two months and this snow serves as a storehouse for a good supply for many months to come. The miners everywhere have a glorious prospect for a bountiful year. To a miner the great drifts and piles of snow are almost as good as piles of twenty dollar pieces, for few of them have any doubt about the ground in their operations. It all depends on a plentiful supply of water. The snow furnishes the water during the coming summer with which they are able to wash out the gold which has laid so long hidden under the gravel hills.

From all parts of the State we have expressions of satisfaction at the heavy fall of snow, and it is predicted by all that the season will be an unusually successful one to the hydraulic miners. In many places operations are enlarging and more gold being taken out than ever before. On the Klamath, in Siskiyou county, below the mouth of Scott river, a great many new claims are now being worked with success. The river is all taken up with mining claims for miles above Oak Bar, and a considerable distance below, and in a year or two more there will be more mining done on the Klamath than in any other mining district in that county.

In Butte county, where they are making a fuss over the decay of mining and the superiority of agricultural pursuits, the mines are doing well. The Oroville Mercury says that a steady stream of gold dust is pouring into the banking house of Rideout, Smith & Co., at that place, and into Wells, Fargo & Co.'s express office. Last year, owing to the small supply of water, not so much was received as formerly. The amounts taken at Wells, Fargo & Co.'s express office there during the three years past were as follows: In 1873, \$1,225,323 were taken in, in 1874, \$1,470,894, and in 1875, \$978,903, making a total of \$3,674,990. Last year the Spring Valley water company, at Cherokee, alone, sent down \$401,599.91, and this year it will take out a much larger amount of dust. On Friday last, while in the express office a few minutes, a large lot of dust came in from the Severance claim at Bidwell Bar. A small piece of bedrock was cleaned up and something over \$1,300 taken out. Small lots of dust were coming in every few minutes. On the whole, we think that more gold has already been sold here than during the whole of last winter.

Without doubt the gold product of California for the Centennial year will be such as to astonish the unbelievers who consider that the mining prosperity of the State is past and that agriculture must in future reign supreme. The miners are all hopeful and in high glee at the plentiful fall of snow, and will show some figures next year, as the result of this year's work, which will convince many that the California miner is by no means yet a thing of the past.

Swindling Mining Companies.

The Mendocino Dispatch thinks that some legislation is needed to curb the operations of swindling mining companies, and says:

"We think it highly important that an act to this effect should be passed. And we even think the Legislature should seriously consider the propriety for providing for the appointment of a Mining Commissioner, whose duty it shall be to unearth the rascalities of these assessment robbers and enforce fair dealing. A mining engineer of undoubted integrity might fill the place, and it should be part of his duties to visit and examine the location of wildcat mines and make public report of the work being done and their merit so far as opened."

The intention of the Dispatch is very good, no doubt, but we do not think the plan offered would be in the least effective in overcoming the evil. Several recent instances might be cited where a number of stockholders, directly interested, have endeavored to unearth supposed rascalities; but, whatever the reason may have been, the parties in power remain in power still, and the investigating stockholders got no satisfaction for their trouble. We must confess that we fail to see how any one man could follow up properly such managements as would be reported to him as dishonest, or attend to one-tenth of the business which such examinations would entail. Every time an assessment would be levied, some disgruntled stockholder would forthwith tell the Commissioner that the assessment was not necessary, and that official would have to go to work, examine the books and papers, examine the mine itself, and make a report; all of which couldn't be done in ten minutes, or ten days for that matter, if done properly.

When we consider the scope of country over which a man might have to travel to visit the various mines which are incorporated and which would be liable to come under his supervision, it becomes evident that a single Mining Commissioner could not attend to his duties. If the business were done by deputy, little reliance could be placed on the report. In fact,

it would be difficult to find any one man to place in so responsible a position, as the office would soon become a political one and be filled by politician, who, after the manner of the class generally, would immediately proceed to fill his pockets.

Under the plan offered by the Dispatch this commissioner would have as fine an opportunity to amass a fortune, in a few years, as any official in the world. The position would be a veritable bonanza to the occupant, and be as valuable as the best mine on the coast, not excepting the Consolidated Virginia. The commissioner would be a perfect autocrat, and would have the authority to say which mine was valuable and which worthless. Any one can see that the chances for irregular practices would be many and tempting. Where the value of one man's opinion was worth \$50,000 to make a mine worth \$500,000, the \$50,000 would be forthcoming, no doubt. A mining engineer would be very well to examine the mines themselves, but few of them would make any pretensions of knowledge of the business details of corporations.

We are afraid that the plan would not do. Even half a dozen or dozen commissioners could not do the work if done properly. Moreover, the people have, within the past few years, come to look upon officials as money grabbers and little else, and would have small confidence in any man who would have such chances for personal aggrandisement. It is a deplorable fact that there are dishonest companies, but legislation to prevent people making fools of themselves, or taking care of their money for them, has never been successful. If, after any doubtful transaction is found out about any man who is a director or trustee of any incorporation, the people would steadfastly refuse to have the slightest thing to do with anything in which he was interested, the evil would be gradually overcome. It would bring a better class of men to the front, and those whose acts shun the light of day would have to retire to darkness themselves. But we must confess that we do not think that the appointment of a mining commissioner would remedy the evil. It would only create one more officeholder, and would make no more honest companies than there are now.

Direct Undercurrent for Hydraulic Mines.

Lorenzo D. Stephens, of Gold Run, has recently obtained a patent through the agency connected with this office, for certain improvements in the sluices which are used for separating and amalgamating the precious metals in hydraulic mining. The invention consists mainly in the construction of a direct undercurrent, whereby the amalgam which may be formed in the long period of time which elapses between cleanings up is protected from depredation, by means of the constant and large quantity of water and rocks which are perpetually passing over the chamber within which it is contained.

The sluice is made in the usual manner with blocks of wood set on end for a bottom. At intervals along the sluice are openings, in which iron bars are placed, which extend across the sluice. Beneath these bars is a space which extends a short distance across the sluice and is covered over, after passing the grating, by an iron plate. Within this space riffles are placed along its bottom, and these riffles are filled with mercury. At the lower end of these riffles, and upon the same general plane, the blocks which form the next section of the sluice commence, so that there will be an offset from the plate over the space, and the plane of the upper section, to this lower plane, wherever one of the riffles occurs.

The iron plate is employed where there is a very limited "drop off" or fall, but where the grade will permit, the inventor substitutes for the iron plate planks placed crosswise in the sluice and forming a false bottom, sufficiently elevated above the riffles to leave space for all the fine particles to pass through. This false bottom will be as low as the bottom of the blocks, and upon it is placed another series of wooden blocks, the tops of which are on a level with the grate bars. These blocks extend to the lower end of the riffles, and have a fall at this point upon the next series of blocks lower down the flume, in the same manner as when an iron plate is used. The blocks wear less and are more economical than iron, where they can be used.

The operation of this sluice is as follows: Water and the auriferous earth are turned into the sluice. The rocks and coarser gravel will pass over the grating, and fall from one level to another, passing down the sluice. The finer sand, gold and some mercury with some water, will pass through the grating and be carried over the riffles, the mercury and gold being stopped in these riffles, while the sand and water will flow out upon the next section below; and this process is continuous throughout the sluice. This direct undercurrent being in the line with the flume or sluice cannot be interfered with by outside parties, as the amount of water, gravel and large rocks passing would imperil the life of any would-be robber.

A two and a half foot vein of pay ore has just been struck in the Hussey mine at Coronopia, eighteen inches of which average \$334 to the ton, the rest being of low grade.

A California Bonanza.

We have examined this week some of the richest gold ores we have ever seen in any quantity. A few hundred pounds of it were sent down from Carson Hill, Calaveras county, California. This ore has just been taken out of the old Carson Hill-Melones property, which mines were worked a number of years ago, but were eventually abandoned, and no work done for some eight or ten years. About two months since work was again resumed by the Melones Consolidated mining company, which includes all the old claim on the hill. This ore is from the old works of the Stanislaus mine, near the river and 100 feet from the surface. The ore was taken from a strigger in the fifteen foot ledge a short distance from the side of the shaft. The feeders are immensely rich in tellurides of gold and silver. This ore which we saw is thickly studded with massive gold, standing out from it in great rough lumps that would brighten the eyes of any old miner. We are afraid to say how many thousand dollars or two the rock would go, but it is so rich it is not to be milled but smelted out.

These mines have been closed down since 1865 for various reasons, among them the difficulty of working the tellurides and want of working capital and reduction works. Mr. G. K. Stevenot, the principal owner, spent a fortune in expensive litigation, but has always had confidence in the property. The mines were pretty thoroughly opened by tunnels and shafts and two mills were put up, but although most magnificent assays were made little was produced from most of the ore, no one understanding how to work it. Lots of it assayed from \$3,000 to \$5,000 per ton, but only five per cent. was obtained by mill process. The difficulties of working the ore have been overcome and Mr. Stevenot is doubtless now about to reap the reward of his perseverance.

The famous Morgan mine, which produced \$1,500,000 in 1850-51 by arrastras and hand mortars, is on this property. The Stanislaus lode, which produced the rock of which we speak, has rich deposits in chimneys and small quartz feeders, which follow the line of slate formation. The compact quartz vein varies in thickness from four to fifteen feet. The free gold on the surface was soon replaced by tellurides and sulphurets, and although various difficulties caused the closing down of the mine those who were familiar with it—Jas. G. Fair, of the Consolidated Virginia mine, among the number—were sure that it would eventually be found to be a very rich mine. Mr. Stevenot has been endeavoring for years to get some one to take hold of the thing with him, but with poor success; but he says that when his rich rock came down the other day he had offers from several for unlimited capital. Now, however, he can stand alone and don't want any capital but thinks he can prove that California gold mines are as good as Nevada silver mines. We are pleased to mention this strike in the old works of this abandoned mine, especially in so short a time after work has been resumed, and note it as a feature of encouragement for others in similar positions. We hope within the next few years to see hundreds of old mines re-opened and active operations commenced upon them. Mines that would not pay ten years since will pay now, and every one has the chance of striking a "bonanza" in any claim they may take hold of.

The snow plows in use on the Central Pacific railroad are a curiosity both in their construction and in the manner in which they do their work. They are immense structures, almost as big as a two-story house and weigh from 45,000 to 55,000 pounds. In front they are shaped like the iron prow of an ironclad frigate, only the sharp vertical portion of this prow changes to a flat surface where it approaches the ground. Attached to this flat or horizontal prow is what is called an "apron." This apron is attached to the prow by means of hinges. It lifts up and lets down directly on the track at pleasure, and when down it is held there by large steel springs. When in motion this apron slides right on the rails, pressing hard on them; but from the rounded surface which it presents to them it glides over the joints and any other little irregularities with ease. The long prow is pushed under the snow, the apron scraping it clear from the rails, and, lifting it up bodily, it meets the vertical section of the prow, which divides it and hurls it off on either side. When running at a high rate of speed, as is often the case, these plows sometimes hurl the snow into the air fifty feet and plunge it in huge masses into the deep chasms and canyons.

THE SUTRO TUNNEL is now in from the mouth to face of header 12,037 feet. The main header, of course, as everybody understands, is a large sized prospecting drift, running in advance of the main tunnel. During the past week a strong force of hands has been put to work enlarging it to the full size of the tunnel, between the air shaft and shaft No. 2.

THE NEVADA CITY powder works will soon be in operation, and expect to produce powder at a cost far below that at present paid in the State. A fruit drying establishment is also projected in the same town.

THE OSWEGO iron works, Oregon, turn out 1,000 tons of pig iron per year, most of which is exported to San Francisco.

Hydraulic Gold Mining in California.

[No. 7.—Written for the Press by C. J. Brown.]

As announced in my last I now proceed to give an account of the preparations for hydraulic mining on the "Polar Star" and "Southern Cross" claims. As before stated, both are under the charge of one man—Mr. Colgrove—and, in part, work jointly. The South Yuba company's ditch, from which these two companies take water, runs along on the mountain side, to the south of the railroad, high above these claims. Mr. C. takes water from the ditch by means of a flume laid at right angles with the ditch, twenty-four feet long and of large capacity, which conducts it in the measuring box or boxes (for all this work is double), 18x21 feet. The water is measured through a four inch aperture along the whole extent of the front and both sides of this box. In front of the box and attached thereto is a four-foot flume, sloping with a slight grade from the center, where there is a division, both to the right and left. On each side of the box is a similar flume with a similar grade, which extends forty feet below the front of the measuring box to the double sand box. This sand box is 12x24 feet, 9 feet high, with a division in the center, which makes two boxes twelve feet square. Each of these boxes has a partition five feet high running from the front to the rear through the center, so that the floor of each is divided into two compartments 12x6 feet. The water drops into the outside compartment of each box, provided respectively with sand gates at the bottom and waste gates at the top. Of course the water must rise above the five-foot partitions before it can flow into the inner compartments next to the main center division.

The twenty-four foot flume is provided with a screen set at an angle of about thirty-five degrees. It is common among miners to set their screens perpendicular, but it is much better to set them up as low an angle as possible, that the debris collected may crowd up on to them above the level of the water. Each sand box is also provided with a screen which slopes from the top of the five-foot divisions to the top of the main center division. The whole is securely covered, and a trap door, under lock and key, provided for each main compartment as a precaution against any damage to the pipes from the insertion of large or heavy substances by evil disposed or careless persons. Over twelve thousand feet of the best quality of lumber has been used in the construction of this preliminary work. There is, perhaps, nothing very new or novel about this whole arrangement, certainly not to the miners of this section. One of Mr. C.'s main objects, however, has been to provide securely against the constant flow of air bubbles into his pipes. This has been a great source of annoyance, damage and loss to hydraulic miners, and many devices have been tried to remedy the evil.

Allow me to digress a moment while I call attention to the discussion of this subject by a certain writer, as published in "Mineral Resources West of the Rocky Mountains," for the year A. D. 1873. Under the caption of "Iron Pipes," (see page 410), he writes elaborately of one or two "simple arrangements" which he thinks "would secure the undisturbed flow of water and permit the air to escape as it accumulates, without interfering with the water rushing into the pipe." Again, he uses this expression: "The air which necessarily enters the feeding pipe with the rush of water," etc.

Why "rush" water into a pipe, especially water containing air bubbles? Air does not "necessarily" enter the pipe with the water. Of course, he is writing not only of the air which for a few moments will disturb a stream issuing from a pipe upon first being filled, but more particularly of the continuous disturbance of a stream by the constant flow of air bubbles through the pipe while in use, for he gives us to understand that "the advantage to be gained from this arrangement," (recommended by him for hydraulic pipes), "would be the almost total exclusion of air from the feed-pipe, and, therefore, the certainty of a solid and even discharge of the water from the hydraulic machine, securing the greatest efficiency and force of the water jet."

My! This gentleman, about the year of our Lord, 1873, must have awakened from a long Rip Van Winkle sleep, for the very devices which he describes and recommends as pipe attachments, as well as more simple and effective ones, had been thoroughly tried and permanently discarded by the miners hereabouts long before his article was published. (I make no reference to air valves along the body of the pipe, which are still in general use.) Except when the pipe is first filled, all the trouble from air has been caused by "rushing" water containing air bubbles directly into the mouth of the pipe. It is well known that the slightest fall of a stream openly exposed to the atmosphere—as water dropping into a sand-box—will force air down into the water beneath. It is also well known that, in what the miners call "dead water," the air so forced down will quickly rise to the surface and again join its natural element. Why, then, not allow it to escape through dead water before reaching, instead of rushing it into the head of a hydraulic pipe?

Instead of entering at the side, as is usual, the pipes for these two claims enter the sand box, near together, on either side of the main center partition, up through the bottom; so

that, when the boxes are full, there will be a solid body of almost still water over the head of each pipe, eight or nine feet deep, and about the same distance to the side of the streams entering the boxes, with the five-foot partitions intervening. When once filled it will be very difficult for air to enter either pipe with a "rush" of water.

These Pipes

Are constructed from Nos. 14 and 16 sheet iron, and are each four feet in diameter at the head; they taper gradually for 500 feet to the size of twenty-two inches; with this dimension they extend 2,800 feet to a twin (so called) provided for each; thence two fifteen-inch pipes extend to either claim, about 500 feet. Each pipe gives a pressure of 500 feet, and has a capacity of 2,000 inches of water.

The pipe will all be painted with red lead, that being the only substance, yet tried, which prevents the pipe from corroding. Each claim will have two of Hoskin's giants, and when once fairly opened will have as fine rigging, and, I predict, will pay as well as any hydraulic claims in the State, for the ground is known to be rich.

Shaft or Incline?

The opening of these two claims is likely to settle a long mooted question among the miners of this district, as to which is preferable—a shaft or an incline; neither lacks its advocates, and both have been tried in working off the top bench of gravel. The incline is given the preference in opening through comparatively light gravel. The Yankee is the only claim which has worked the heavy bottom stratum. It works through a shaft, and Col. Ludlum, who champions the shaft, is now sinking another on his line of works, while Mr. Colgrove has raised an incline on the Polar Star, and purposes to do the same on the Southern Cross. Not being a practical miner, I feel a little timid

they have been introduced, and there will probably be a large demand for them the coming season, if our present prospect of good crops holds out. Farmers and threshers visiting the city are invited to call on this firm and examine the engines on exhibition at their store. The illustration on this page, for its size, gives a good idea of the engine, showing the man in the act of getting up steam with straw. The engines are eighteen horse-power, and fitted with the Shive governor.

Many of our farmers who live in places where wood is plenty have not yet seen the straw burning engines working, and some of them even refuse to believe it possible to keep steam with straw to run a threshing machine steadily. Firing with straw is not difficult. I took a boy who had never fired an engine and put him to feeding straw. He watched me firing for about ten minutes and then I let him go to work, showing him a little about keeping the fire right. I had plenty of steam the first day.

As far back as the year 1856 a mill of six pairs of stones was successfully driven by a straw burning engine. This mill was situated on the Pardang estate, in Lower Hungary, and since then the established fact of the possibility of straw being used for the generation of steam has led to a dozen, more or less, good patents being taken out in England, some of which are now working successfully in Hungary and other grain growing countries.

There are over 200 straw burning engines in Hungary. Over fifty of these are made by Garrett & Son, an English firm. They all use the ordinary fire-box boiler, but made somewhat larger than for wood and coal. The makers of straw burners in this State say they cannot burn straw in fire-box boilers, and have all adopted Mr. Rice's plan of the return-tube boilers, generally known as the Cornish boiler. Messrs. Fowler, of Leeds, England, have

altered a coal burning engine for the season of 1875, and did considerable of the work myself. It then cost me about \$900. The engine worked well. The boiler made plenty of steam with ease. I threshed three months with this engine in San Joaquin county and at Halt Moon bay, and will say that I consider straw the best fuel, preferable to wood or coal, even if the cost of straw was equal to that of wood or coal.

An even pressure of steam can be kept easier with straw than with wood or coal. The straw must be fed steadily. If overfed the main fire is filled up, much smoke is made and the fire smothered. The effect of feeding straw too fast is about the same as feeding too slow. In one case the fire is smothered and in the other the engine draws too much cold air. In either case the steam pressure is reduced.

There is less danger of fire in the field from straw burners than from wood, which fuel is generally used in this State. There is no need of pulling the fire out when going to the next stack, as is often necessary when burning wood. A fire occurred from this cause near where I was threshing, in the season of 1874. An engineer pulled his fire just before moving in the evening, and threw some water on the burning wood, but did not put it out. A few hours after, and in the night, the stubble caught fire from this wood, and the fire ran to the next stacks, where the machine had moved to, also to another machine near by; both separators, driving belts, tools, four stacks of wheat and a lot of empty sacks at each machine were destroyed by this fire.

The farmers prefer the straw burning engine. Threshers who have straw burners do not have to look for work—the work looks for them.

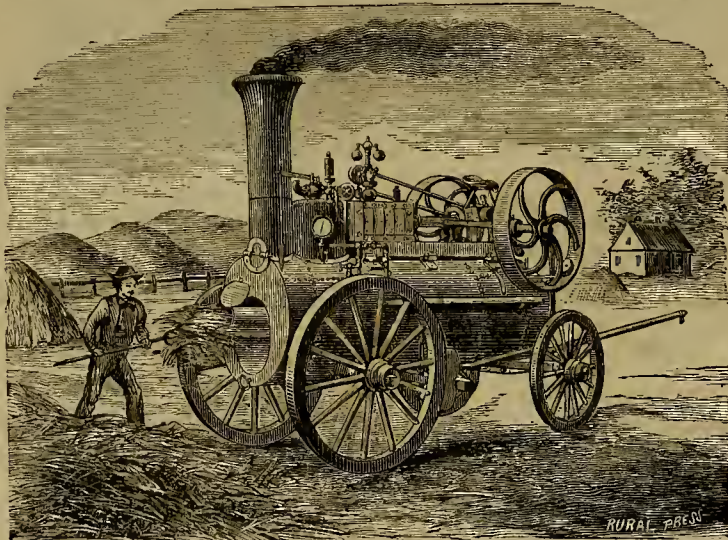
J. W. RILEY.

Hardware.

The great depression that pervaded the business community during the past year has been shared in to its fullest extent by that branch of trade now under consideration. The close and increasing competition and the heavy expense of conducting the business has rendered the strictest attention to details necessary, and the time is fast approaching when dabblers and speculators will have to withdraw from the market, leaving the business in the hands of the practical few who have made it the business of their lives. When this normal condition of affairs is reached we may expect it to be a profitable pursuit, and not before. Another existing evil of the trade is the want of a proper classification. Nails, rope, iron and steel, and agricultural implements are now handled almost exclusively by the hardware dealers, whereas they are each separate and distinct branches of themselves, and should be so conducted. Nails and rope have been the bane of the business for many years and will continue to be until they are dropped from the lists.

Among the recent changes in the trade, the most important has been the purchase, by Jas. E. Gordon, of the stock and business of Pillsbury, Hussey, Adair & Co., formerly Marsh, Pillsbury & Co. Mr. Gordon is well known in the community, having been a resident since 1849, and brings to his aid a practical experience of fifteen years in the business in this city. The ranks of the trade have also been increased by the advent of Frank Bros. & Co., whose specialty will be agricultural implements, and having large means at their command, will do a very extensive business in the line. The market has been free during the year from the violent fluctuations in prices in the East which has marked former years, neither has the premium on gold varied sufficiently to be worthy of note, although the variation was greater than for the preceding year. These elements of stability have been of material service to the trade in preventing any more serious results from the financial panic precipitated upon us by the failure of the Bank of California and its attendant evils, from which we have not yet fully recovered.

While prices in 1875 did not fluctuate to any great extent, there was a steady, gradual decline throughout the year, there having been no article of any importance on which we can report a marked advance during the same period. Nails which at the opening of the year were selling at \$4.25 rates are now jobbing at \$3.75 rates. A strong effort to introduce the product of the Western mills has been rewarded with fair success, although the Eastern nail still holds the market. In this connection we note a growing demand for the Anchor brand, made in Baltimore. Bar iron has declined a quarter cent per pound, but has ruled very steady, considering the low price in the East. Shovels and spades, and other steel goods have declined materially, as have also brass and iron screws; with the latter we expect to drive out the English article. American files and saws have made the once favorite English brands almost unknown, while Pittsburgh steel has given the English article a severe set back during the year. Among the varied articles that go to make up a hardware stock, there is one that generally receives but little attention, and yet is of the utmost importance to a large majority of our manufacturers, and that is the item of sand paper. A great void has hitherto existed in this particular, which has just been filled by the introduction among the trade of "New England flint paper," an article of rare excellence in its way. The trade in builders' hardware and mechanics' tools was lively during the past year, with excellent prospects for 1876.



STRAW-BURNING ENGINE.

about advancing my own opinion as to the merits or demerits of either; but I confess that my frequent observation of the hydraulizing in the Yankee, and what I conceive would be the result of attempting to work off such masses of heavy boulders through an incline—inclines my head to the shaft; nevertheless, "chewing the string is proof of the pudding," and I await further developments, hoping that both plans are best for those who adopt the one or the other, according to the quality of gravel to be washed.

Dutch Flat, January 28th, 1876.

Straw Burning Engines.

Straw burning engines for steam plowing and threshing are considered the latest improvement in agricultural machinery by our valley farmers, who have had an opportunity to see them working successfully. There were about forty of these engines at work in the State during the harvest of 1875. Mr. H. W. Rice, of Haywoods, made over one-half of this number. But for his experience and experiments, in connection with Mr. D. Morey, of Watsonville, our farmers would probably not have had a straw burning engine at work in this State yet. Mr. Morey obtained a patent in 1873, and a re-issue in May, 1875; Mr. Rice obtained a patent January, 1874, and re-issue in May, 1875. Credit is due Mr. Morey for his persevering efforts to obtain a suitable feeder for this style of engine. This system of feeding straw is very simple and effectual, as it excludes all cold air from entering the boiler above the fire, which it is impossible to do with the ordinary furnace with wood and coal. Messrs. Rice and Morey have sold their interest and right to make these engines on this coast to Marcus C. Hawley & Co., Nos. 108 and 110 Front street, San Francisco, and corner of Second and J streets, Sacramento. They are making arrangements to manufacture a large number of the Rice straw burning engines for the season of 1876, as every engine manufactured last year found a ready sale, although the crops were light. They are a favorite engine where

constructed two 12-horse (English nominal) traction engines for use in Russia, which are to be fired with straw (fire-box boilers). The engines are intended for steam plowing, and this work is much heavier than threshing. These engines will have to indicate 60-horse power. Under these circumstances Messrs. Fowler did not like to rely on straw alone, so a tank is provided, standing across the top of the boiler, and from this petroleum can be blown in spray into the fire-box. Some trials of the engines have been made which, even with English straw of inferior quality, gave eminently satisfactory results, and there is no reason to doubt that with straw of Russian growth the results will be quite satisfactory.

Messrs. Ransome, Sims & Head, of Ipswich, England, sent one of their patent straw burning engines to this city last spring. This engine has an ordinary fire-box boiler, made larger than a coal fire-box. The straw is put in by means of a pair of toothed rollers. The rollers are run by a belt from the engine shaft, at a speed of from forty to fifty revolutions per minute. This keeps a small but steady supply of straw going into the fire all the time. By special invitation of Messrs. Ransome's agent, in this city, I attended a private trial of this engine at his place some months ago. The engine worked well, consuming the straw thoroughly. The straw, of course, makes some clinker, which is readily removed by an arrangement of bars between the grates, moving to and fro easily and quickly, clearing the fire. This engine will probably be used during the harvest of 1876, and the readers of the RURAL who are interested in this subject may look for a more detailed account of the work of this engine.

As this or some other arrangement is much needed in our State, an attachment that can be applied to the many engines now in use for the successful burning of straw would save our farmers many thousand dollars. Unless we have an attachment for this purpose that will work successfully, second hand wood and coal burning portable engines will become a drug in the market. To remove the old engines from the boilers, and purchase a new boiler of the Cornish style, put the engine on and remount it, will cost from \$1,000 to \$1,300. I

[PUBLISHERS' ANNOUNCEMENT.]

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It will not Fade, Chalk, Crack, or Peel off, and will last twice as long as any other Paint.
In ordering White, state whether for Outside or Inside use, as we manufacture an Inside White (Flat) for inside use, which will not turn yellow, and produce a finish superior to any other White known.

Put up in $\frac{1}{2}$, 1, 2 and 5 gallon packages, and in Barrels. Sold by the Gallon.
For further information send for Sample Card and Price List, or apply to the office.

OFFICE AND DEPOT: FACTORY:
117 Pine Street, near Front. Cor. 4th & Townsend Sts.
3v9-cow-bp-1y SAN FRANCISCO, CAL.

AMMONIA!

For Washing and Cleaning Purposes.

For Sale by all Grocers.

This article is universally used in Europe, and recently introduced for general family use in San Francisco and neighborhood, is already in great demand. It is now the intention of the manufacturers to introduce it all over the Pacific Coast, at prices which will bring it within the reach of every household.

It is unequalled for cleansing Woolen Fabrics, Cutlery, Carpets & Crockery; for Scrubbing Floors, Washing Paint, Removing Grease Spots, Shampooing or Bathing.

It renders water soft, and imparts a delightful sense of coolness after washing.
DIRECTIONS.—For Laundry, use two to four tablespoonfuls to a wash tub of water. For bathing, use one tablespoonful in the bath tub. For removing grease spots, apply with a brush, undiluted, and wash with water afterward.

For stimulating the growth of plants, use a few drops in every pint of water used in watering.

PRICE.—Per Pint Bottle, 25 cents; per quart Quart Bottle, 40 cents; per Half Gallon, 75 cents.
Also, SULPHATE OF AMMONIA for chemical purpose, fertilizing, and the preparation of artificial manures. AMMONIACAL PREPARATION, for the prevention and removal of boiler scale. CRUDE AMMONIA, for general manufacturing, and PURE LIQUOR and AQUA AMMONIA for chemical and pharmaceutical purposes.

Manufactured by the
SAN FRANCISCO GAS-LIGHT CO.
cowbp

FRANCIS SMITH & CO.,

MANUFACTURERS OF

Hydraulic Pipe,

AND

ARTESIAN WELL PIPE.

Having the Latest Improved Machinery, we can make it an object to

Mining & Water Companies

OR

WATER WORKS,

To Contract with us for

SHEET-IRON PIPE.

All Sizes Made and all Work Guaranteed

30 Beale Street,

OF INTEREST TO

MINING COMPANIES.

A Mining and Civil Engineer, of long experience, collected in Europe and America, well acquainted with correct management of mines and mills, practised in projecting and constructing mining and milling machinery, and especially machinery for mechanical ore concentration, is open for re-engagement, and would prefer the task of constructing works for mechanical concentration of low grade ores on a well developed mine, or of remodeling ineffective works in the ore milling line for successful operation. Apply to Messrs. DEWEY & CO., of this office, for reference.

SAN FRANCISCO

Pioneer Screen Works,

Removed to 32 Fremont Street, near Market.

J. W. QUICK.
Manufacturer of perforated sheet metals of every description, at reduced rates. Mill owners using Battery Screens extensively, can contract for large supplies at favorable rates. This is the only establishment on the Coast devoted exclusively to the manufacture of Screens

Mining Superintendent.

E. B. Smith, for nearly twenty years engaged in the direction of mines and mining enterprises, can be engaged to take charge of any legitimate mining enterprise. Mr. Smith thoroughly understands the "Sonora" process of chlorination and lixiviation, being the originator of the same, and the erection of all machinery and furnaces for the treatment of rebellious ores.
Office—439 Bush street, S. F.

MINING ENGINEER.

A Mining Engineer, with the best of best of references, thoroughly experienced in the opening and superintending of mines and mills, desires an engagement Address, "MINING ENGINEER," MINING AND SCIENTIFIC PRESS Office, San Francisco.

Metallurgy and Ores.

JOHN TAYLOR & CO.,

IMPORTERS OF AND DEALERS IN

ASSAYERS' MATERIALS

Chemical Apparatus and Chemicals, Drug-gists Glassware and Sundries, etc.

512 and 518 Washington street, SAN FRANCISCO

We would call the special attention of Assayers Chemists, Mining Companies, Milling Companies, Prospectors, etc., to our large and well adapted stock

ASSAYERS' MATERIALS

—AND—

Chemical Apparatus,

Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast.

Our Old and Silver Tables, showing the value per ounce Troy at different degrees of fineness, and valuable tables for computation of assays in Gravel Grammes, will be sent free upon application.

7v25-tf

JOHN TAYLOR & CO.

Nevada Metallurgical Works,

21 First street.....San Francisco.

Ores worked by any process.

Ores sampled.

Assaying in all its branches.

Analysis of Ores, Minerals, Waters, etc.

Plans furnished for the most suitable process for working Ores.

Special attention paid to the Mining and Metallurgy of Quicksilver.

E. HUHN,

C. A. LUCKHARDT,

Mining Engineers and Metallurgists.

RODGERS, MEYER & CO.,

COMMISSION MERCHANTS,

ADVANCES MADE

On all kinds of Ores, and particular attention

PAID TO

CONSIGNMENTS OF GOODS.

4v16-3m

Instructions in Assaying,

Chemical Analysis, Determination of Minerals, and use of the Blow-pipe.

HENRY G. HANKS

Will receive a few pupils at his new laboratory, 617 Montgomery street, up-stairs. TERMS MODERATE

LEOPOLD KUH,

(Formerly of the U. S. Branch Mint, S. F.)

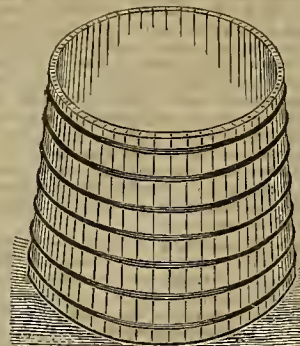
Assayer and Metallurgical CHEMIST,

No. 611 Commercial Street,

(Opposite the U. S. Branch Mint.

SAN FRANCISCO CAL.

7v21-8m



WATER TANKS of any capacity, made entirely by machinery. Material the best in use; construction not excelled. Attention, dispatch, satisfaction. Cost less than elsewhere.

WELLS, RUSSELL & CO.,

Mechanics' Mills, Cor. Mission & Fremont Streets,

3v28-8m-sa

Diamond Drill Co.

The undersigned, owners of LESCHOT'S PATENT for DIAMOND-POINTED DRILLS, now brought to the highest state of perfection, are prepared to fill orders for the IMPROVED PROSPECTING and TUNNELING DRILLS, with or without power, at short notice, and at reduced prices. Abundant testimony furnished of the great economy and successful working of numerous machines in operation in the quartz and gravel mines on this coast. Circulars forwarded, and full information given upon application.

A. J. SEVERANCE & CO.

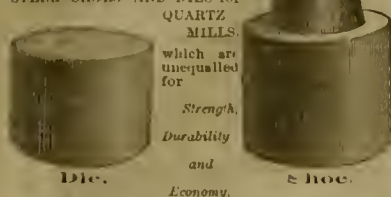
Office, No. 315 California street, Rooms 1 and 2.

2v26-tf

Machinery.

STEEL SHOES AND DIES
FOR QUARTZ MILLS.

Made by our improved process. After many years of patient research and experiment we have succeeded in producing STEEL SHOES AND DIES for



Will wear three times longer than any iron shoes.

BUILDERS AND CONTRACTORS

Of Quartz Mills, Pans, Separators, Concentrators, Jigs, Hydraulic Rock Breakers, Furnaces, Engines, Boilers and Shuttles, and General Mining Machinery in all its details, and Furnishers of Mining Supplies. All orders promptly filled.

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88 Liberty street, N. Y.

Examination solicited.

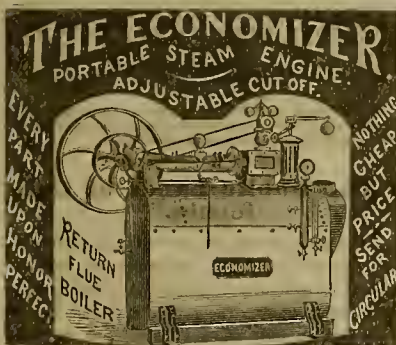
The Ingersoll Rock-Drill



Is Extensively Used in the East and TAKES THE PLACE OF ALL OTHERS, Wherever Introduced, because it can be run with less power, labor and repairs, and do more work than any other Drill in the market. It has but few parts, is easily handled, being light, and HAS AUTOMATIC FEED, which saves labor. WE ASK FOR TRIAL AGAINST ANY COMPETITOR. For particular information regarding Drills or Air Compressors, send for circular to

J. B. REYNOLDS,

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Cotton Gins, Printers, Cheese Makers, Laundries, Cabinet Makers, and All Manufacturing where Light Power is Required.

A. L. FISH & CO.,

Sole Agents for California,

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Manufacturers of ENGINE LATHES, 48 inches swing and smaller; VERTICAL BORING MACHINES, suitable for jobbing and boring Car Wheels; UPRIGHT DRILLS, 36 inches and smaller, and other Machinists' Tools.

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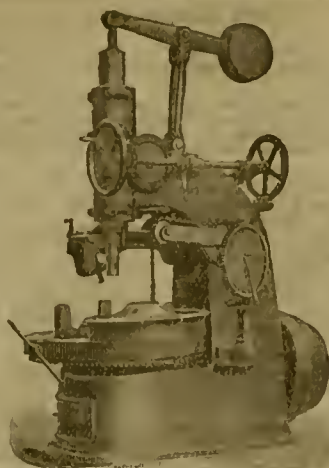
STEAM ENGINES & BOILERS

From 3 to 75-horse power. Shafting, Pulleys, Hoist Gears, Quartz Mills, Water Tanks, Spanish Arasas, Pumps and Pipes, Hoopern and Belden Pans, and all kinds of Machinery for sale at lowest prices by

THOS. P. H. WHITELAW,

256 Brannan street, S. F.

Highest cash prices paid for all kinds of Machinery.



No. 4 Car Wheel Borer.



We have the best and most

complete assortment of

Machinists' Tools

In the Country,

Comprising all those

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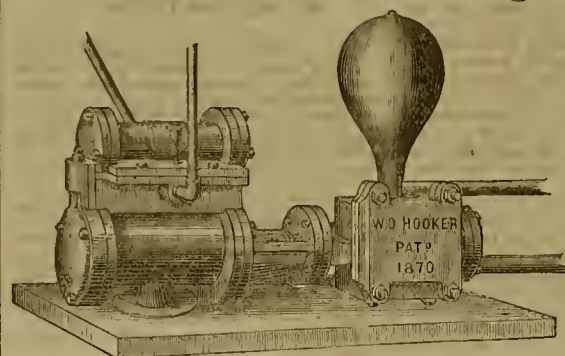
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R. E. REPAIR SHOPS.

For Photographs, Prices and Description, etc.,

NEW YORK STEAM ENGINE CO.,
98 Chambers Street, New York.

Hooker's Patent Direct Acting Steam Pump.



N. B.—Also manufacturer of Hooker's Deep Well and Double-Acting Force Pump. Received the Silver Medal awarded at the last Mechanics' Fair in San Francisco.

W. T. GARRATT,

Cor. Fremont & Natoma

streets, S. F.,

Sole Proprietor & Manu-

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Coast.

SIMPLE, CHEAP AND

DURABLE.

Adapted for all pur-

poses for which Steam

Pumps are used.

The Best Pump in Use.

SEND FOR CIRCULAR

CANDLES.

MITCHELL'S

New York Candles

Full Weight and 14 ounce.

Will be found on comparison to be

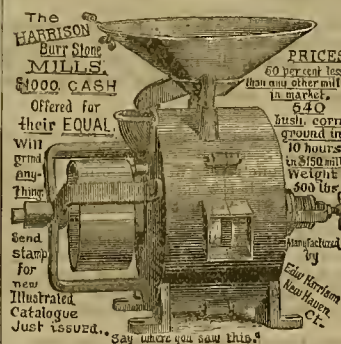
Unequalled in Quality.

14 GMG OZ.

STEARIC ACID
CANDLES
GEO. M. GRANT & CO.
PHILADELPHIA.

FOR SALE BY ALL THE LEADING JOBBERS.

Geo. M. Grant & Co., Agents. San Francisco.



G. W. & C. A. LANE, Exeter, N. H., write, Dec. 13:

"We started the heavy 20-Inch Corn Mill last Friday you sent to Baldwin & Tabor, Manchester, N. H. We ran it most all day, and ground 60 bushels corn per hour. The mill you sent us at Haverhill, Mass., for A. S. Hook, is doing wonderfully. It is grinding on an average 2,500 lbs. good meal per hour, and has ground 2,800 lbs. in an hour. It is driven by an engine with a 3-in. cylinder, and takes the place of a 30-in. mill of another kind that, when doing its best and loading the engine with all it could carry, only ground 1,500 lbs. per hour. If there is a mill built that can beat that we would be pleased to see it brought out."



Address, FRASER, CHALMERS & CO., Chicago, Ill.

Buffalo Excelsior Pony Planer & Matcher.



Patented March 30, 1875.

Best of its kind in use. Price, complete, \$75. Also, small Pony Planers and Planing Machines, Knives, which are recommended as superior and extra in quality. 100 Scroll work designs free on receipt of stamp. For circulars giving detailed information, address GEO. PARK, Buffalo, N. Y.

Excelsior

LATEST IMPROVEMENT.



Scroll Saw.

Saw only without attachments, \$9.

Double Treadle, including one doz. Saws, thirty immitable Fret Sawing Patterns and Prepared Wood to the value of \$4. A new device for tightening Saw, Power Drilling attachment, Wrench, Oil Cup and Driver, Speed, 800 strokes per minute. Saws 1 1/2 in. thick. Price, complete, cased and delivered on board cars or at Express office, \$12

GEO. PARK, Buffalo, N. Y.

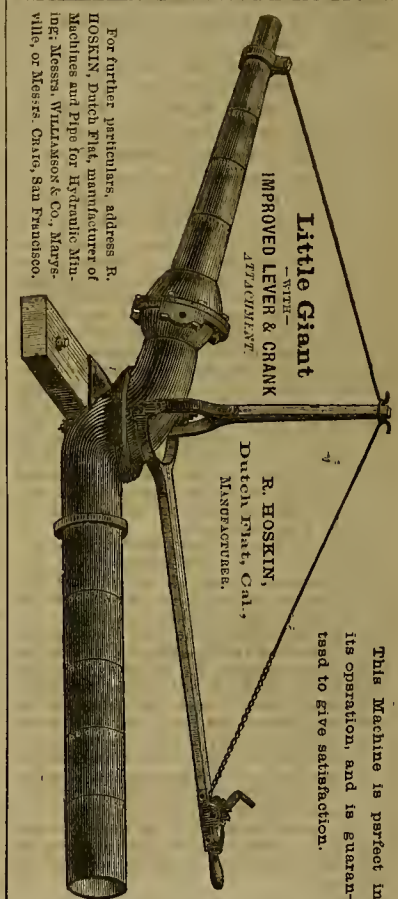
BUFFALO PONY PLANER.

Nearly One Thousand in Use.



BUFFALO PONY PLANER Will earn itself and pay expenses of running in 8 days. Price from \$60 upwards, each. Also, small Pony Planers and Matchers, and Planing Machine Knives. Recommended as superior and extra in quality. Circulars free. One hundred Scroll designs free on receipt of stamp. Address GEO. PARK, Buffalo, N. Y.

DUNHAM, GARRIGAN & CO., San Francisco, are Sole Agents in California for any Heavy Wood Working Machinery.

Little Giant
IMPROVED LEVER & CRANK
ATTACHMENTF. HOSKIN,
Dutch Flat, Cal.,
MANUFACTURER.

This Machine is perfect in its operation, and is guaranteed to give satisfaction.

SANBORN & BYRNES,



Mechanics' Mills, Mission Street.

Best First and Fremont, San Francisco. Orders from the country promptly attended to. All kinds of Stair Material furnished to order. Wood and Ivory Turners, Billiard Balls and Ten Pins, Fancy Newsels and Balusters. 25 1/2-8m-lip

F. MANSELL & CO.,
SIGN PAINTERS,

423 PINE STREET,

(Between Montgomery and Kearny.)

Persons engaged in the following business can have their Signs Painted at contract prices, for goods or articles in which they trade, viz:

Merchant Tailors,	Gents' Furnish'g G'ds.
Bootmakers,	Furniture Dealers,
Hatters,	Jewelers,
Hotels,	Piano Fortes,
	Wine Merchants, Etc., Etc.

PATENTS & INVENTIONS.

A Weekly List of U. S. Patents Issued to Pacific Coast Inventors.

FROM OFFICIAL REPORTS FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.

By Special Dispatch, Dated Washington D. C., Feb. 1st, 1876.

FOR WEEK ENDING JANUARY 18TH, 1876.*

ORE FURNACE.—Horatio G. Livermore, S. F., Cal.

WATER HEATING ATTACHMENT FOR STOVES AND RANGES.—James H. Mitchell, S. F., Cal.

COLOR PRINTING BLOCKS.—Joseph Perkins, S. F., Cal.

MACHINE FOR TREATING RAWHIDES.—Herman Royer, S. F., Cal.

Coupling for Train Telegraphs.—Andrew Ryder, Oakland, Cal.

FRUIT DRIERS.—George A. Deitz, Chico, Cal.

*The patents are not ready for delivery by the Patent Office until some 14 days after the date of issue.

NOTE.—Copies of U. S. and Foreign Patents furnished by Dewey & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s Scientific Press American and Foreign Patent Agency, the following are worthy of mention:

ORE ROASTING FURNACES.—Horatio G. Livermore, S. F. Mr. Livermore has two distinct patents in furnaces. The first is an improvement in furnaces for roasting or desulphurizing fine ores, which consists in a novel construction of a furnace having a floor placed at such an angle that the ore, if left to itself, would slide to the bottom. The space between this floor and the top is comparatively limited, and is crossed by numerous dams or abutments, so that the ore will be detained and will only move when a portion is withdrawn from below, when the whole body of ore will move downward, the dams serving to stir and turn the ore and loosen it so that the vapors can escape and a new surface will be exposed to the heat. The furnace is situated at the foot of the incline and the heat passes up over the body of ore and is deflected upon it. Suitable feeding and stirring devices and passages for the escape of fumes to the condensers are made. The body of ore being so thin and so thoroughly exposed to the heat will be roasted almost as fast as it can be fed and withdrawn at the bottom, the operation being continuous.

The second patent is for a furnace more particularly adapted for quicksilver ores. It consists in the employment of two or more fireplaces upon the sides of the ore chamber, so placed that the heat will have its fullest effect upon the ore, while at the same time the ore will be prevented from passing into or clogging the fire flues, without the necessity of arches or fenders of any kind. Above the fireplaces are passages which branch out from the ore stack or chimney and open into a chamber which extends entirely around the ore chamber and collects the vapors from it in readiness to deliver them to the condensers. By this construction the inventor is able to provide a continuous working furnace in which the greatest heat passes through the ore while it is contained in a narrow place, the heat passages are not clogged and a free escape is provided for the fumes.

WATER HEATING ATTACHMENT FOR STOVES AND RANGES.—James H. Mitchell, San Francisco. The object of this invention is to provide an improved water heating attachment for stoves and ranges, to be used instead of the copper boiler or reservoir ordinarily employed for that purpose. It is well known that the copper boilers at present in general use for supplying hot water in houses are liable at times to interfere with the cooking operations of the stove or range, owing to the abstraction of heat therefrom by the rushing in of a quantity of cold water to supply a vacancy caused by drawing off water from the boiler; thus often lowering the temperature when it is necessary to maintain a uniform or high degree of heat for cooking. There are also many other disadvantages connected with the use of these boilers, such as their liability to leak, collapse, burst from freezing, etc. Mr. Mitchell's arrangement is to overcome these difficulties and supply hot water to houses by a better method. He is a man of experience in this line and the invention is not by any means an experiment.

Instead of surrounding the stove or range with a water jacket for supplying hot water to a boiler located above it, he places the hot water tank or reservoir in the upper story or attic of the building, or on the roof, if found most convenient. This tank can be made of wood or metal, and its upper end be left open like any ordinary tank. A water pipe leads from the mains in the street, and an ordinary cock operated by a float serves to keep the tank filled. A pipe is then led from near the bottom of the tank through the wall of the chimney, and thence down along the wall in-

side of the chimney to a point opposite the stove. It then passes through the wall of the chimney and into the stove or range, where it is boiled in the fire chamber, and is thence led back through the wall of the chimney, thence up along the inside of the wall, where it again passes through the wall and into the tank near its top.

This pipe, it will be readily perceived, is a circulating pipe, by means of which the water in the tank can be heated to the boiling point. As the water in the coil which is inside of the fire-place becomes heated it rises in the pipe, giving place to the colder water, and thus a circulation is established and maintained until all of the water in the tank is heated to a uniform temperature. Branch pipes can be led off from the circulating pipe to any part of the house, so as to supply water in every room if desired, and suitable pipes can be applied between the stove and chimney, by means of which hot water can be drawn in the kitchen and which will serve when desired as a means of cleaning out the pipes and tank. When hot water is drawn off from the pipes the cold water which takes its place in the tank will be raised to a considerable temperature before it reaches the range, so that it cannot much affect the heat of the range. While the inventor thus does away with the copper boiler he provides for supplying a double quantity of water in a more convenient manner throughout the house, and as the circulating pipes pass up close against the heated wall inside of the chimney, the loss by radiation is diminished at least fifty per cent., while in cold weather the wall of the chimney will retain sufficient heat through the night to keep the water in circulation and prevent its freezing. By this arrangement the inventor is able to supply a much larger quantity of hot water and more direct to any part of the house, and at the same time avoid the use of lead pipes, the oxidation of which is known to be poisonous. Any kind of stove or range can be employed in this circular with much less heating surface in the fire chamber, thereby saving a large percentage of fuel. The pipes can be readily detached from the stove or range, without the aid of a plumber, by simply turning off the water at the stops between the chimney and stove range and disconnecting the coupling which connects them.

COLOR PRINTING.—Joseph Perkins, S. F. This invention relates to improvements in color printing, which are more especially applicable to printing oil cloths where many colors in a thick medium and small and intricate patterns are employed, and in which the printing has hitherto been done by many impressions. The improvement consists in the employment of a pattern block having two or more tubes or passages leading to its face, so that as many colors may be applied at one time as may be desired. It also consists in the employment of a system of reservoirs for each of the tubes and converging connecting tubes opening into them, and a means for producing a pressure upon the surface of the point in the reservoirs, so that a supply of colors is continuously led to a printing surface within a narrow compass, so as to form a colored pattern. The invention thus overcomes the difficulty hitherto met in this class of color printing that the thick medium employed and the smallness of the patterns has necessitated numerous impressions and the use of a single color at each impression.

TIRE UPSITTER AND PUNCH.—John H. Mertz, Paso Robles, San Luis Obispo county. This is an improvement in that class of machines which are employed to upset or shorten bars of iron and more particularly wheel tires, and in a combination with the same a punch for perforating metal plates or bars.

In the Overman mine the connection has been completed between the west drift of the 1100-ft level and the bottom of winze from the level above, giving a much needed ventilation of the level, and furnishing a good supply of pure air. A cross-cut has now been started to cut the ledge and determine its value. The result is looked forward to with a great amount of interest, and is in reality a feature of more than ordinary consideration to all the mines on the south end of the Comstock.

R. W. RAYMOND, United States commissioner on mining statistics, having engaged Frank F. Osbiston to furnish him a report on the mines of the Comstock range, the latter has delegated S. V. Mooney to visit the superintendents of mines in that vicinity for the purpose of collecting the data required for the intended report.

Trouble is brewing between the Woodville and Rough and Ready mines, the proprietors of the latter having sunk a shaft directly between the old and new shafts of the former. The Woodville folks have warned them off, but they keep on working, and a lawsuit is probably the next thing in order.

The new Consolidated Virginia assay and bullion reduction works are fast approaching completion, and when done will without doubt be not only the largest but the most complete in all its appointments of any private assay office in the world.

On the Julia mine sinking the shaft and driving the drifts on the 1600 and 1500-foot levels is prosecuted at all points with burleigh drills, and is making as good progress as is being done in any mine on the Comstock lode.

New Incorporations.

The following companies have filed certificates of incorporation in the County Clerk's office at San Francisco:

OLIVER M. Co.—Jan. 28th. Object: To mine and carry on the business of milling in California. Directors—A. K. Grim, Wm. H. Bruner, John F. Cooper, S. H. Cowles and Allen Oliver. Capital stock, \$2,340,000.

METALLIC M. Co.—Location: Columbus mining district, Esmeralda, Nev. Directors—George S. Dodge, T. B. Shannon, S. Reinhardt, A. B. Townsend and Jeremiah Maynard. Capital stock, \$5,000,000.

UNION PLAC M. Co.—Feb. 1st. Location: Gold Hill, Nev. Directors—Gustavus Cox, G. J. Fray, A. H. Yeazell, Henry Bredhoff and Frank L. Sullivan. Capital stock, \$10,000,000.

TENNESSEE HILL HYDRAULIC GRAVEL M. Co.—Feb. 1st. Location: El Dorado Co., Cal. Directors—Herman Levinson, Maurice Dore, Alexander Ansdin, George F. Maynard and Henry Marshall. Capital stock, \$5,000,000.

CRATER G. M. Co.—Feb. 1st. Object: To carry on a general business of milling and mining. Directors—A. Fray, J. W. Whitlatch, O. D. Morrison, J. A. Wells and N. O. Fasset. Capital stock, \$6,000,000 in 60,000 shares.

NORTH LEOPARD M. Co.—Feb. 2d. Location: Cornucopia district, Nevada. Directors—George Hest, C. R. Great-house, Chas. S. Drew and Theodore A. Brown. Capital stock, \$10,000,000.

THE CALIFORNIA CONS. M. & M. Co. has filed a certificate of increase of capital stock from \$3,000,000 to \$6,000,000.

THE SOUTH JUSTICE M. Co. has filed a certificate of increase of capital stock from \$5,000,000 to \$10,000,000.

Meetings and Elections.

WELLS-FARRO MINING Co.—Jan. 28th. Trustees: D. L. McDonald, H. Z. Wheeler, G. W. Hammer, A. O. Taylor and R. F. Bunker. The income of the company was \$49,362.15, mainly from assessments 1, 2 and 3; and disbursements amounted to \$48,354.11.

BIO TREE CONSOLIDATED G. & S. M. Co.—Jan. 28th. Calaveras county, Cal. A. K. Grim (President), J. Baker, Jr., N. B. Stone, Wm. Murphy, W. A. Keele, Trustees; and O. A. Sankey, Secretary.

EUNOPA.—S. K. Thornton has been chosen trustee of the Europa, vice H. O. Kibbe, and C. L. Weller selected Vice President.

FLORIDA M. Co.—Feb. 2d. Trustees: E. W. Leonard (President), O. Eldredge, J. Halladay, Wm. Fraeuvorn and Josiah Belden, Trustees. L. Hermann, Secretary, and P. G. De Noon, Superintendent.

NORTH CONSOLIDATED VIRGINIA.—Feb. 2d. Trustees: R. O. Rogers (President), H. P. Waklele (Vice President), E. M. Fry, N. B. Stone and Geo. W. Hopkins; Secretary, Joseph Maguire; Superintendent, D. H. Jackson.

The Belcher company have elected John Crockett Secretary in place of the late Secretary, H. O. Kibbe.

The pumping machinery in the Utah mine is finished, after a few tests it will be set regularly to work to drain the water from the shaft, and as soon as that is exhausted, and any damage that may have happened to the shaft is repaired, work on the lower levels will be resumed.

THE WAGONTOWN mines in Idaho are reported as turning out splendidly. New arrivals are noted every day, house rents are very high, a small house bringing from \$75 to \$100 a month, and it is thought that the town will have at least one thousand inhabitants during the coming summer.

MR. GEORGE WESTFALL has been appointed superintendent of the Globe Consolidated mine in place of John F. Jewell, resigned. Immediate steps are being taken to crowd the erection of the new pumping machinery with all possible energy.

MR. POWERS has bought the King mine, in Stoneman, Pinal county, Arizona, for \$200,000, one-half cash and the remainder in installments, a condition of the purchase being that the buyer is to put up a mill in connection with the mine.

It is reported that the Bear river iron mines, located about forty miles from Sacramento, and owned principally in that city, prove to contain large amounts of that very valuable substance, tellurium.

A RICH gold lead, thought to be the richest ever struck in Southern Oregon, has been discovered in Rogue river, in Josephine county, about fifty miles below Jacksonville, and assays about \$500 to \$1,100 per ton.

THE companies on War Eagle mountain, Idaho, who are largely in debt to the employees for wages, propose to lease them the mine for a limited period, allowing them the entire product to liquidate their claims.

On the Florida mine grading preparations for first-rate hoisting machinery is now going forward energetically, the present donkey engine not being of sufficient capacity to do the requisite work.

THE Carson Tribune says that Senator John P. Jones has purchased the controlling interest in the Eureka mill, the largest and perhaps the best situated on the Carson river.

THE new coal mine in Coos county, Oregon, being developed by C. B. Jones, is said to promise to be equal in value to any in that section.

THERE are only two Chinese as yet in the Black hills, and they, of course, are running the "washee" business.

PROSPECTING the 1600 and 1700-foot levels of the Crown Point mine as yet affords no new or important features.

No man or woman is safe while the least remnant of cough or cold, or any symptoms of pulmonary disease, lingers in the system. Expel the cause of danger with RAY'S HONEY OF HOREHOUND AND TAR. Pike's Toothache Drope cures in one minute.

METALS.

[WHOLESALE.]

WEDNESDAY M., February 2, 1876.

American Pig Iron, 3 ton	38 00	@	36 00
Scotch Pig Iron, 3 ton	38 00	@	37 00
White Pig, 3 ton	38 00	@	38 00
Oregon Pig, 3 ton	38 00	@	40 00
Refined Bar, good assortment, 3 D.	38 00	@	34 00
Boiler, No. 1 to 4	38 00	@	5 00
Plate, No. 5 to 8	38 00	@	5 00
Sheet, No. 10 to 14	38 00	@	5 00
Sheet, No. 16 to 20	38 00	@	5 00
Sheet, No. 22 to 24	38 00	@	5 00
Sheet, No. 26 to 28	38 00	@	5 00
Horse Shoes, per keg	38 00	@	8 00
Nail, 100 lb	38 00	@	10 00
Norway Iron	38 00	@	6 00
Roller Iron	38 00	@	6 00
Other Irons for Blacksmiths, Miners, etc.	38 00	@	4 00
JOZEK			
Braziers'	35	@	—
Copper Tin'd	37 1/2	@	—
O'Neil's Pat.	37 1/2	@	40
Sheathing, D.	37 1/2	@	25
Sheathing, Yellow	37 1/2	@	25
Sheathing, Old Yellow	37 1/2	@	12 1/2
Composition Nails	34	@	14
Composition Bars	34	@	14
3/4 IN. — English Cast, 3 D.	30	@	25
Anderson & Woods' American Cast	30	@	15
Drill	30	@	15 1/2
Flue Pipe	18	@	25
Flue Sheet	9	@	20
TIN PLATES—			
10x14 1/2 Obarcoal	10 50	@	11 00
10x14 1/2 Obarcoal	12 50	@	10 00
Roofing Plate 1/4 Obarcoal	12 50	@	10 00
Banca 1/4	12 50	@	10 00
Australian	18	@	20
ZINCO—			
By the Tank	18	@	11
Sheet, 36x72 No 10 to 10 1/2 D	12 1/2	@	12 1/2
do do 7x3 ft, No 11 to 11 1/2 D	12 1/2	@	11 1/2
do do 8x4 ft, No 8 to 10	12 1/2	@	12 1/2
do do 8x4 ft, No 11 to 10	12 1/2	@	12 1/2
NAILS	3 00	@	3 75
WICKS LYER, per lb	7 1/2	@	7 50

(Continued from Page 85.)

level, running the north cross-cut, which is being advanced rapidly. The chlorides continue steadily at work in contracts taking out ore.

EUREKA DISTRICT.

STRIKE IN THE JACKSON.—Eureka Sentinel, Jan. 28: We are creditably informed that a body of fine ore has been struck in the Jackson mine, in the southwest side drift from the tunnel running from the shaft towards the Phoenix ground. The drift at the shaft is 300 ft from the top, but as the side drift runs into the hill, the new discovery is perpendicularly a considerably greater distance from the surface, and is immediately under the old ore body which rendered the mine so famous several years ago. We are not informed as to the magnitude of the body, but hope to be enabled to inform our readers in a few days.

CHERRY CREEK DISTRICT.

MINING INTELLIGENCE.—White Pine News, Jan. 22: The following intelligence comes to us from this mining camp: The Teacup is working its full complement of men, and the mine is producing large quantities of high grade ore. The mine belonging to the company has been only a few days in operation, and the ore is being shipped to the other mines in the district. The Star company is vigorously pushing the drift running west from the 370-ft level, and is taking out ore that strongly resembles the Austin sulphate ore both in appearance and richness. They are also sinking below the 370-ft level in good ore. The active operations that are going on in the different mines has produced a marked improvement in all kinds of business, and the community seem to be well contented with the future outlook.

WARD DISTRICT.

Rich Rock.—White Pine News, Jan. 22: We have been shown some very rich rock just brought in from this immensely rich mining district, which assays "way up" in the thousands. The specimen shown us was from the Paymaster mine, and is the richest silver specimen we have seen in many a day, and the party having the specimen says that there is lots more in the mine just like it. The Paymaster company only shipped just enough of their good ore to pay current expenses, and the balance is sacked and piled away in the mine. The bullion shipments from this district will be very large when reduction works are erected and working commences, which will probably be next summer. All the mining news we receive from this district is of the most flattering character.

Colorado.

TAYLOR'S MILL.—Colorado Miner, Jan. 23: The fine mill recently erected by Messrs. Taylor & Son, for the concentration of low grade ores by the Krom, or dry, process, started up this week, and appears to be doing admirable work and doing it rapidly. From what we have seen of the operations thus far we are prepared to record our belief that the process will prove an entire success.

The ore market is tolerably brisk just now. The Judd & Crosby works and the Pelican mine are running full blast; the Silver Plume concentrating company's works and the Taylor works are busily engaged separating the valuable minerals from low grade stuff that has been hitherto practically worthless; the ore buyers for other markets are doing their full share of work; and everybody seems hopeful and happy and everything prosperous and promising.

The Centennial year comes in with encouraging news from all parts of our mining districts. The amount of supplies going up to the mountains shows that lively work is going on in all the camps. Some new strikes are reported on Kelson mountain, which promise high yields during the season. As soon as the snow goes off, a host of prospectors will dot the hitherto neglected slopes on Silver creek, where the recent strikes in the Wall Street and one or two other mines give promise of as rich and prosperous a mining camp in the near future as prospecting has developed on Democrat mountain within the past two years. Old mines will be worked with heavier forces and good machinery, and many comparatively new mines will be worked with energy this season, upon which only development work has been heretofore expended. Never in the history of the county has there been a time when our miners felt more sanguine of a busy and prosperous season ahead than they do now.

Idaho.

OWHREE COUNTY MINES.—Idaho Statesman, Jan. 25: From Mr. Wm. B. Thoms, time keeper at Oro Fino mine on War Eagle mountain, who arrived here on Sunday evening, we learn the following concerning mining operations in Owyhee county: The Oro Fino mine, with P. F. O'Connell, superintendent, has been working about a hundred men, and has been taking out from 55 to 60 tons of ore per day, till the 10th inst., when work was partially suspended. Operations will be resumed on this mine in a few days. The ore which has been taken out of the first and second levels south is good, gold in the rock being visible to the naked eye. Some of the rock assayed as high as \$300 to the ton. The mine is in good working condition, and the ledge below the third level ten feet in width and the rock of good quality. The company intend sinking on this ledge as soon as operations are resumed.

Mr. Baldwin is superintendent of the Golden Chariot mine. The mine started up about the 10th inst. Much labor has been done in clearing out the water with which the mine had been filled. The water is now nearly all out, and rock is being taken out of the 9th and 10th levels. About 40 men are employed.

Captain Bledsoe has received the appointment of superintendent of the Poorman mine as successor to Dudley Hoyt. The intention is to settle up the indebtedness and work the mine extensively under the new management.

The above are the only mines upon which any work is being done. About one hundred men have been obliged to leave camp on account of the suspension of operations on the other ledges. All are hopeful, however, that work will be resumed on all the ledges before spring and will be prosecuted more vigorously than ever before.

THE ATLANTA COUNTRY.—Idaho Statesman, Jan. 22: The Wide West, at Red Warrior, shut down last week. This was occasioned by the mill being out of repair, the heavy expense of running the mine when not fully prepared, and the necessity of Mr. Hussey going East. He has gone East to procure means to work the mine properly, and expects to be back by the first of April, and to be prepared to prosecute work vigorously and successfully. At Atlanta mine, where the progress is satisfactory, and a most brilliant season. The Monarch company's Atlanta is still yielding rich shipping ore in abundance. Their mill is running constantly on third-class ore. The Buffalo company are getting good ore from their Atlanta. Their ledge will be tapped soon by their lower tunnel, which they have been running now for four months, being some 300 feet in length.

Captain Baxter & Co. are preparing work on the Leonora, and recently have been getting some magnificent specimen ore; they have some 700 tons in sight that will mill from \$25 to \$30 per ton. They are now connecting their lower tunnel with the shaft from the surface and the workings, so as to get this ore out; intending this tunnel to run in further, and they will have backs of ore to keep a mill running for a year or two. They were kept back on account of not getting their supplies in, and consequently are going slow this winter.

IDaho CITY MINES.—Placerville I found to be remarkably dull; snow about four feet deep, and consequently a good prospect for the future; and they anticipate a

prosperous mining season with a bountiful harvest of gold. Every one seemed hopeful of better times coming.

At Quartzburg I found things very quiet, nothing going on but the operations of the Gold Hill company who are working the tail force of men and taking out what they term first-class ore. They expect to start up their mill about the 20th of this month. When they get to running it will make a great difference in things in that part of the Basin, as they will then disburse about \$5,000 per month.

Oregon.

MINING ITEMS.—Oregon Sentinel, Jan. 19: From parties who have recently arrived from Rogue river we learn that the owners of the Scott mine have sunk a shaft on their ledge to the depth of 12 ft, and that the ledge at this depth is about the same width as when first discovered; that the ore taken out is very rich, and the proprietors are sanguine that it will yield very large returns. The English company at Galice creek have commenced operations, and have been at work about three weeks in the claim formerly owned by Thos. & Co., but have not yet made a clean-up. They have now about 125 men employed, and we expect shortly to hear of their taking out a great quantity of ore. The miners in this vicinity, owing to the recent cold weather, have been compelled to suspend operations, but as the weather has moderated considerably, they are again at work livelier than ever. San. Bowd-nand Wilfer Prefontaine are running two claims with hydraulic apparatus on the right hand fork of Jackson creek, and will no doubt go over considerable ground while the supply of water continues. The Oregon is doing well, and the company have, we are informed, suspended work for the present on the Althouse ledge, but we have not learned the cause of the suspension, which we hope is only temporary. Everything augurs well for an abundant yield of the precious ore in Southern Oregon the present winter, and, as a consequence, during the coming summer money will be more abundant in this country than for many years past, which has been owing to a lack of water with which to work the placer mines.

HEATH DISTRICT.—Bedrock Democrat, Jan. 19: This is the name of the district where the large, rich and extensive silver lodes have been discovered, about sixty miles east of us, immediately across Snake river. There is no doubt but that the mines are good. The camp will be a large one, and its trade will be of great importance to the point that secures it. It naturally tends toward Baker City as the most accessible. The citizens of that district only ask of our people that they will aid in the building of a good wagon road to Snake river—to the ferry—and then their trade will come to us. This is a matter that interests our business men as well as our farmers, and if they wish to secure a good and lasting trade and a market for their surplus farm products, they should aid in the building of the road asked for. The expense incurred for our people would be but small in comparison to the benefits they would derive from the outlay. If they wish to secure the trade they must make some effort to do so—other places are working for it.

Utah.

BINGHAM CANON.—Or. Salt Lake Tribune, Jan. 26: Half the Aladdin mine has been disposed of to Chicago parties. Thirty thousand dollars, it is said, was the consideration. If so, it is cheap at those figures. This is a good beginning for 1876, and an indication of the whole year.

The Winnamuck whistle awakes the echoes of the Ogkib. The latest machinery works smoothly, and the rock in the shaft is favorable to rapid sinking, and everything looks encouraging.

Despite the intense cold of the past week, a few of our placer companies are washing with good results. Gravel in some cases is being piled up to be run through the sluices in the spring.

The English placer company are now in 360 ft with the Winnamuck ledge. They are running in very good drifting ground, and have been fortunate in not having encountered any logs or very large boulders.

CONSOLIDATION.—There has been a rumor on the streets for the past week of a big consolidation of mining interests in Little Cottonwood, which, it is said, will engulf nearly all the mines on Emma hill. As far as can be gathered, it is a consolidation of the Emma Hill Consolidated mining company's claims with the North Star mine, recently purchased by Mr. Honore, of Chicago and others. There have been rumors of the Emma mine being also included in this gigantic enterprise, though that may be considered with allowance. There is no doubt that there is a powerful combination at work to effect the consolidation of the prospect in the future, to effect the Vallejo, South Star and Titus and Elmer mines, as they are all supposed to be on the same vein as the North Star, and within the ground claimed by it.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

J. L. THOMPSON—San Francisco.

B. W. WELLS—California.

JOHN ROBERTSON—California.

G. W. McGUIRE—San Jose county.

J. M. McARTHUR—Los Angeles, Santa Barbara, Ventura, San Bernardino and San Diego counties.

J. W. RILEY—San Francisco.

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No. 224 Sansome street, SAN FRANCISCO.

CAMPO, SAN DIEGO CO., CAL., July 3d, 1874.
MESSRS. DEWEY & CO.—Gentlemen: To-day I received the patent and other papers of my animal trap, that you so successfully worked through the patent office for me, for which please accept my best wishes. The chances are that I will have another application for you to make for me before long. I am well satisfied with your manner of doing business, and I think inventors of the most stand in their own light when they do not put their business into your hands.
I remain yours truly, A. M. GASS.

GIVE YOUR FULL ADDRESS when you communicate on business to this office, especially in returning newspapers. The fact that your name is on our subscription list is of no assistance to you. Without sending your post office address we should have to look over thousands of names to find yours.

THE MINING AND SCIENTIFIC PRESS is the leading journal of America. New processes and mechanical inventions are illustrated and discussed in its every issue. It is a 16-page sheet, handsomely printed, for \$4 a year. Dewey & Co., publishers, San Francisco. [Mt. Lincoln News, Alma, Colorado.]

A REAL CONVENIENCE.—DEWEY & CO: Please send me the RURAL PRESS. It is a real convenience and I cannot do without it. Enclosed you will find five dollars. Fraternally, B. F. E. K. Anaheim, Cal., October 12, 1874.

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PATENTS obtained promptly; Caveats filed expeditiously; Patent reissues taken out; Assignments made and recorded in legal form; Copies of Patents and Assignments procured; Examinations of Patents made here and at Washington; Examinations made of Assignments recorded in Washington; Examinations ordered and reported by Telegraph; Rejected cases taken up and Patents obtained; Interferences prosecuted; Opinions rendered regarding the validity of Patents and Assignments; every legitimate branch of Patent Agency Business promptly and thoroughly conducted.

Our intimate knowledge of the various inventions of this coast, and long practice in patent business, enable us to abundantly satisfy our patrons; and our success and business are constantly increasing.

The shrewdest and most experienced inventors are found among our most steadfast friends and patrons, who fully appreciate our advantages in bringing valuable inventions to the notice of the public through the columns of our widely circulated, first-class journals—thereby facilitating their introduction, sale and popularity.

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In addition to American Patents, we secure with the assistance of co-operative agents, claims in all foreign countries which grant Patents, including Great Britain, France, Belgium, Prussia, Austria, Victoria, Peru, Russia, Spain, British India, Saxony, British Columbia, Canada, Norway, Sweden, Mexico, Victoria, Brazil, Bavaria, Holland, Denmark, Italy, Portugal, Cuba, Roman States, Wurtemberg, New Zealand, New South Wales, Queensland, Tasmania, Brazil, New Grenada, Chili, Argentine Republic, AND EVERY COUNTRY IN THE WORLD where Patents are obtainable.

No models are required in European countries, but the drawings and specifications should be prepared with thoroughness, by able persons who are familiar with the requirements and changes of foreign patent laws—agents who are reliable and permanently established.

Our moderate prices for obtaining foreign patents, in all cases, will always be as low, and in some instances lower, than those of any other responsible agency.

We can and do get foreign patents for inventors in the Pacific States from two to six months (according to the location of the country) sooner than any other agents.

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Situated so remote from the seat of government, delays are even more dangerous to the inventors of the Pacific Coast than to applicants in the Eastern States. Valuable patents may be lost by extra time consumed in transmitting specifications from Eastern agencies back to this coast for the signature of the inventor.

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We take great pains to preserve secrecy in all confidential matters, and applicants for patents can rest assured that their communications and business transactions will be held strictly confidential by us. Circulars free.

Home Counsel.

Our long experience in obtaining patents for inventors on this Coast has familiarized us with the character of most of the inventions already patented; hence we are frequently able to save our patrons the cost of a fruitless application by pointing them to the same thing already covered by a patent. We are always free to advise applicants of any knowledge we have of previous applicants which will interfere with their obtaining a patent.

We invite the acquaintance of all parties connected with inventions and patent right business, believing that the mutual conference of legitimate business and professional men is mutual gain. Parties in doubt in regard to their rights as assignees of patents, or purchasers of patented articles, can often receive advice of importance to them from a short call at our office.

Remittances of money, made by individual inventors to the Government, sometimes miscarry, and it has repeatedly happened that applicants have not only lost their money but their inventions also, from this cause and consequent delay. We hold ourselves responsible for all fees entrusted to our agency.

Engravings.

We have superior artists in our own office, and all facilities for producing fine and satisfactory illustrations of inventions and machinery, for newspaper, book, circular and other printed illustrations, and are always ready to assist patrons in bringing their valuable discoveries into practical and profitable use.

DEWEY & CO.

United States and Foreign Patent Agents, publishers Mining and Scientific Press and the Pacific Rural Press, 224 Sansome St., S. F.

UNITED STATES**Mineral Land Laws, Revised Statutes,**

And Instructions and Forms Under the Same.

We have just issued a pamphlet containing the general mineral land laws of the United States, with instructions of the Commissioner of the Land Office. The contents of this pamphlet comprise all of the Government laws with relation to mineral lands of interest to the mining community, as follows: Mining Statute of May 10th, 1872, with Instructions by the Commissioner of the Land Office; Mining Statute of July 26th, 1866; Mining Statute of July 9th, 1870. Forms required under Mining Act of May 10th, 1872, as follows: Notice of Location; Request for Survey; Application for Patent; Proof of Posting Notice and Diagram of the Claim; Proof that Plat and Notice remained Posted on Claim during Time of Publication; Register's Certificate of Posting Notice for Sixty Days; Agreement of Publisher; Proof of Publication; Affidavit of \$500 Improvements; Statement and Charge of Fees; Proof of Ownership and Possession in Case of Loss or absence of Mining Records; Affidavit of Citizenship; Certificate that no Suit is Pending; Power of Attorney; Protest and Adverse Claim; Non-Mineral Affidavit; Proof that no Known Veins Exist in a Placer Claim, etc. There is also given the U. S. Official Land Law and Regulations thereunder. The work comprises thirty pages, and will be sold, post-free, for 50 cents. It should be in the hands of every one having any mining interests. DEWEY & CO., Publishers of MINING AND SCIENTIFIC PRESS, S. F.

Dewey & Co. { 224 SANSOME ST. } Patent Agt's.

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Cherokee Flat Blue Gravel Company.

Location of principal place of business, San Francisco, Cal. Location of works, Cherokee Flat, Butte county, Cal.

NOTICE.—There are delinquent upon the following described stock, on account of assessment (No. 35) levied on the twenty-eighth day of December, 1875, the several amounts set opposite the names of the respective shareholders, as follows:

Name.	No. Certificate.	No. Shares.	Amount.
O. Waller.....	1	624	\$31.20
Lonis Schmidt.....	2	128	6.40
E. J. Pfeiffer.....	10	480	24.00
A. Cassell.....	17	4,608	230.40
Mrs E. M. Walton.....	21	128	6.40
Mrs Mary W. Farrington.....	35	144	7.20
Geo W. Ramage.....	36	320	16.00

And in accordance with a resolution of the Board of Directors, made on the twenty-eighth day of December, 1875, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the office of the company, room 13, No. 328 Montgomery street, San Francisco, Cal., on Saturday, the nineteenth day of February, 1876, at the hour of one o'clock, a. m., of such day, to pay delinquent assessments, together with costs of advertising and expenses of the sale.

O. H. BOGART, Secretary.

Office, Room 13, Safe Deposit Building, San Francisco, Cal.

Eureka Stone Manufacturing Company.

Location of principal place of business, San Francisco, California.

NOTICE is hereby given, that at a meeting of the Board of Directors of said company, held on the twenty-sixth day of January, 1876, an assessment (No. 3) of ten cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin to the Secretary, at the office of the company, No. 567 Market street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the first day of March, 1876, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Wednesday, the twenty-second day of March, 1876, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

P. D. MOWELL, Secretary.

Office, No. 567 Market street, San Francisco, Cal.

Moore's Flat Blue Gravel Mining Company.

Principal place of business, San Francisco, Cal.

Location of works, Moore's Flat, Nevada county, Cal.

NOTICE is hereby given, that at a meeting of the Board of Directors, held on the 26th day of December, 1875, an assessment (No. 1) of ten cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold and silver coin, to the Secretary at the office of the company, room 1, No. 531 California street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 10th day of February, 1876, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Wednesday, the 22nd day of March, 1876, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

WM. SMALL, Secretary.

Office, Room 1, No. 531 California street, San Francisco, Cal.

Union Stone Company of California.

Location of principal place of business, San Francisco, Cal.

Location of works, San Francisco, Cal.

NOTICE is hereby given, that at a meeting of the Board of Directors of this company, held on Wednesday, the fifth day of January, 1876, an assessment (No. 3) of twenty cents per share was levied upon the capital stock of said company, payable immediately in United States gold coin, to the Secretary, at the office of the company, No. 19 First street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on Tuesday, the eighth day of February, 1876, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Wednesday, the 22nd day of March, 1876, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

R. E. KNOX, Secretary.

Office, No. 19 First street, San Francisco, Cal.

DIVIDEND NOTICE.

San Francisco Savings Union, 532 California street, corner Webb. For the half year ending with December 31, 1875, a dividend has been declared at the rate of nine (9) per cent. per annum on Term Deposits and seven and one-half (7½) per cent. on Ordinary Deposits, free of Federal tax, payable on and after January 12, 1876. By order of
LOVELL WHITE, Cashier.

DIVIDEND NOTICE.

California Savings and Loan Society, 512 California street. The Directors have declared a dividend of nine and six-tenths (9-6/10) per cent. per annum on Term Deposits and eight (8) on Ordinary Deposits, for the half year ending December 31, 1875, free from Federal tax, and payable on and after Saturday, January 8, 1876. By order
D. B. OHLSOHL, Secretary.

Placer Mining Outlook.

After a careful survey of the field, and with reports from all parts of the county, says the *Placer Argus*, we feel justified in claiming that the mining prospect is decidedly better than it has been for many years. The yield of gold in this county will undoubtedly be larger than it has ever been, except in the flush days of placer digging.

Our quartz mines are undeniably in splendid shape. The St. Patrick and Ophir made a clean-up at the close of last month that, after paying for its expensive new machinery, placed it out of debt, and gave it a handsome surplus to begin the New Year. Its stopes are yielding abundant ore of a high grade to keep the mill running all the time, and there is ore in sight to keep this up for more than two years. Next month will in all probability yield the stockholders a dividend, to be followed regularly thereafter by a handsome return for their investment.

The Bellevue is not now in operation, but its owner, George D. Aldrich, is confident that the mine is of great value, and he will soon take steps to make it productive.

The Good Friday is yielding large quantities of rich ore, and the owners feel sure they have found their bonanza.

The Julian, near Newcastle, is steadily driving ahead, and is paying its energetic proprietors well.

The Rising Sun, at Colfax, continues to pay dividends, and is a source of permanent wealth. Numerous ledge are being prospected in various parts of the county, and while it is not expected that all of them will grow rich, good strikes are being reported, and considerable gold is being gathered from them.

It is our gravel mines, though, that Placer county must look to as its chief source of wealth, and from these storehouses the principal yield of treasure will flow. At Dutch Flat and Gold Run, the extensive tunnels that have been driven through the mountains at great cost are about completed, and are now in use. By their aid the great beds of blue gravel of fabulous wealth are now being worked, and we do not doubt that the amount of gold taken out at those points will far exceed the yield of any previous year. The business of both these towns is feeling the impetus and prosperity is sure to come. The two great water and mining corporations, the Cedar Creek company and the Gold Run ditch and mining company, are both preparing for extensive improvements. They have acquired Summit valley, and will next season erect the largest reservoir in the State.

At Iowa Hill and vicinity work is going on with vigor. The finest mines in the county are to be found there, but heretofore the want of water has prevented their profitable working. Now this difficulty has been overcome, the rich beds of auriferous gravel will yield untold quantities of the precious metal.

At Michigan Bluff, Forest Hill, Yankee Jims and all along that divide, everything is alive. New claims have been developed, and old ones that in times past have proven rich are being refitted, and with the abundance of water that we are receiving, the prospect is bright with promise. Nor is the more primitive style of mining entirely done away. Quite a good many men are profitably employed in placer mining, and are meeting with good success. We have chronicled within a few weeks the finding of several nuggets varying in value from \$17 to \$100, and the yield of finer gold from this source is considerable. Taken altogether the new year is bright with promise, and should not come unforseen change take place, we may count on a revival of business that will gladden the hearts of thousands.—*Placer Argus*.

THE ENGLISH CHANNEL TUNNEL.—Since the failure of the Bessemer swinging cable steamer and the double keeled *Castalia*, increased attention seems to be drawn toward the proposed tunnel, as the only practical solution of an easy channel passage. Some time ago a preliminary shaft was commenced near the shore on the English side, and now a similar work has been commenced on the French side of the channel. The depth of this latter will be 328 feet—about half the utmost depth which it is supposed the tunnel will require. The object of these shafts are to prove by ocular demonstration, *in situ*, whether the geological formations at certain depths agree with the theory of the scientists. The feeling is certainly gaining ground that such a work is needed and will pay as an investment; and if the two shafts, when completed, should develop the expected facts, the project will be considered practical, and then nothing will be left but to provide the millions of pounds sterling required to carry out the idea. This latter provision will be a difficult one to realize; but it is not beyond the possibilities of a proper combination of English and French financial enterprise.

CHINESE IMMIGRATION.—In Congress, the House Committee on Foreign Affairs, though opposed to the joint resolution of Representative Piper requesting the President to use all expedient means to have the existing treaties of our Government with that of China, so modified as to prevent the further immigration of subjects of that empire to the United States, have consented to withhold a report to the House until the reception of the resolutions of the California Legislature on that subject.

It is rumored that the Occidental and Oriental steamships will withdraw.

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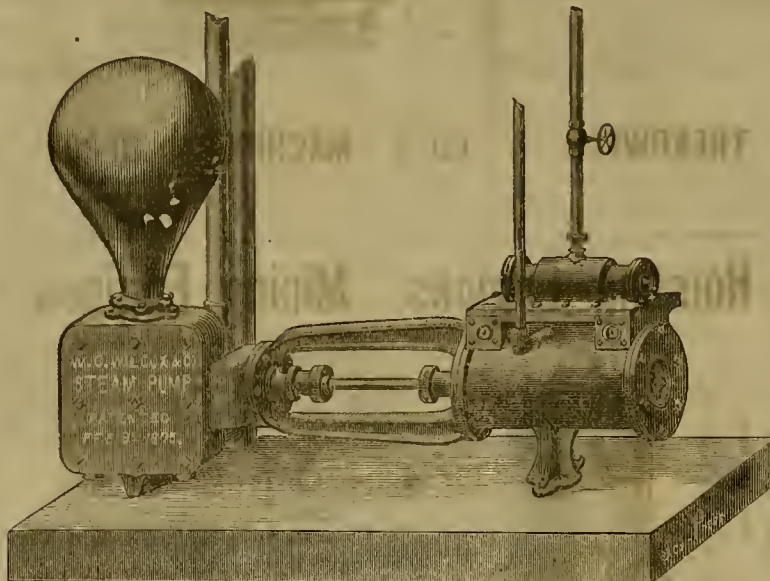
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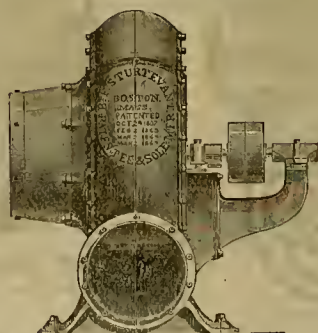
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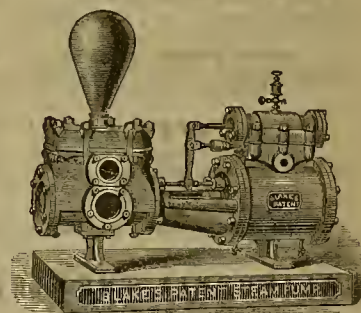
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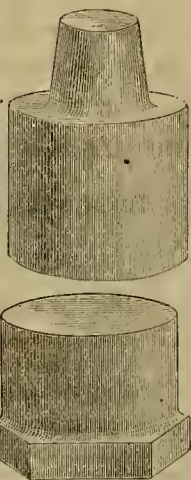
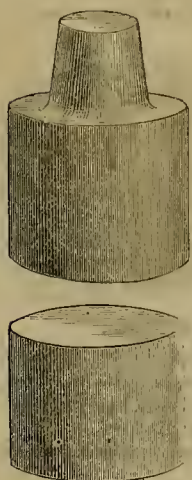
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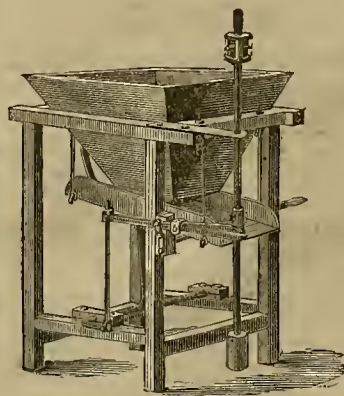
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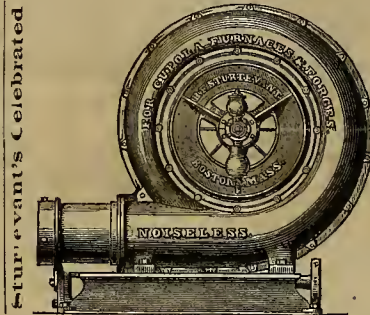
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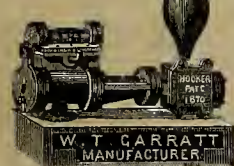
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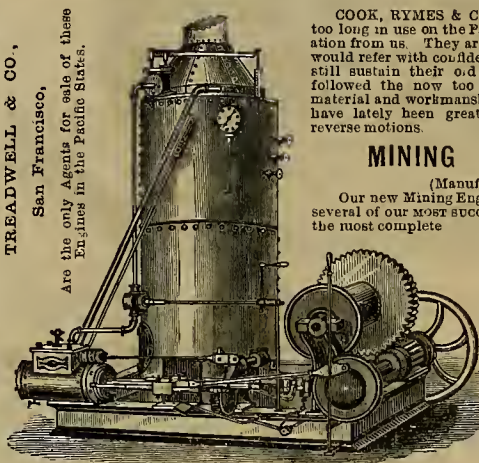
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SAN FRANCISCO, SATURDAY, FEBRUARY, 12, 1876.

VOLUME XXXII
Number 7.

Valuable Improvement in Pumps.

We illustrate on this page two styles of pumps for continuous discharge, with respectively three and four cylinders. The special object of this improvement is to cause the pump to throw a full and rapid stream of water continuously and with uniform velocity. Mr. A. J. Smith, 222 and 224 Fremont street, invented this pump and applied for a patent thereon, but finding that he had been anticipated by another inventor (S. D. Lount, of Chattanooga, Tenn.) he has purchased the right for this coast, and is now manufacturing the pumps in various styles and sizes.

The pumps are made in the peculiar manner shown in the illustrations, in order not only to effect a saving of power, but also to keep the stream of water in a continuous motion and avoid the jar and strain which, as is well known, occurs in ordinary single cylinder pumps.

The construction, as will be seen, is quite simple. The power is applied in the ordinary way. In Fig. 1, *D* is the feed pipe and *E* the discharge pipe. *A A A A* are the cylinders, *C C C C* are the valves, and *B B B B* the passages by which the water passes from one cylinder to the other in its continuous motion. As the crank shaft revolves the pistons operate in the usual way.

It will be seen that the cranks are arranged in Fig. 1 to follow each other at intervals of 90 deg. The object of this construction is that the water may always be impelled by that crank which is moving up or down most rapidly at any particular time, while those cranks which are passing the dead points shall have ceased for the moment to have much, if any, effect on the stream. In this manner the water is forced along at all times by that plunger which is at or near its maximum speed; the others meanwhile moving back in turn to take their places for another throw. In every case the lifting or forcing power is necessarily applied by the most rapidly moving piston, and this water driven by this piston faster than the other pistons are moving, opens their valves and passes along without obstruction from said pistons, although all are virtually operating in the same cylinder or water passage way.

Mr. Smith also makes these pumps with three pistons, as shown in Fig. 2. In this case the three pistons are arranged in single cylinder, one over the other, to operate in the same way as with four cylinders. With three cylinders, however, the cranks follow each other at intervals of 120 degs., the passages, *B B*, being arranged to carry the water from the top of one cylinder to the bottom of the next. In this figure, *A A A* are the cylinders; *B B* the passages connecting them; *C C C* the valves; *D* the feed pipe, and *E* the discharge. The three cylinders are but parts of one passage way for the water and the three pistons all operate upon the same stream, keeping it in continuous motion.

It will be seen that after once starting the pump the stream is kept continuously flowing, and there is no "thud" or jar as in ordinary single cylinder plungers, which have to start the stream anew at each stroke of the piston. Any one familiar with the action of pumps, knows that this causes the greatest strain upon the valves and cylinder, and also limits the throwing capacity.

In the three and four cylinder pumps, as the valves open and close, when relieved from pressure, they are able to do a large amount of work with little or no wear and tear. They are especially adapted to pumping to great elevations, which in mining work is an essential feature. Mr. Smith says he can make them to raise water three or four thousand feet at one single lift, and thus do away with the great number of pumps which are now required to raise water that distance in short lifts of two or three hundred feet each.

For windmills, this continuous action motion is also very advantageous, as it will run slow or fast, without any jar or jerking motion. For irrigation, pumping in large quantities, it is claimed that it will pump with greater economy, as wind power is variable and unsteady. Mr. Smith informs us that he is about to

construct a pump and windmill complete, which will be capable of pumping 20,000 gallons per hour to a height of 100 feet, at a cost which need not exceed \$1,500. In this connection we are referred to this work done with these pumps by Louie & Co., Italian gardeners on the Hudson tract, South San Francisco, where there is a three cylinder pump

stroke. Running 50 strokes a minute, it raises about 4,000 gallons an hour. Its construction is somewhat different from those illustrated here.

The qualities mentioned above make this pump also invaluable for pumping by horsepower, as it makes as even work for the horse as hauling a load on a smooth rail. The

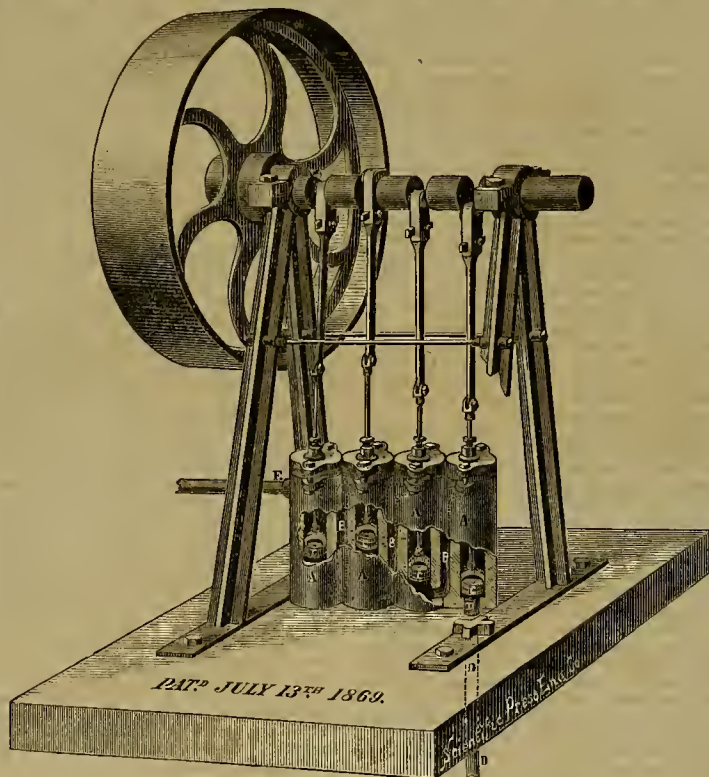


FIG. 1. FOUR CYLINDER CONTINUOUS ACTING PUMP.

at work (5x8) in place of a three and one-half inch chain pump, and from which Mr. Louie asserts that he is getting nearly three times the water which this chain pump furnished him with the same windmill. There is a pump

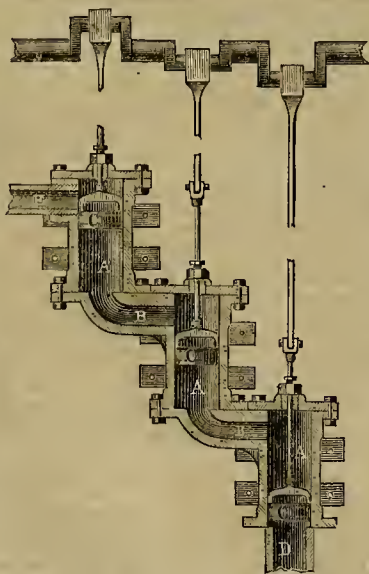


Fig. 2. Three Cylinder Pump.

constructed on this principle at the Chicago brewery, placed 60 feet deep in a nine inch well, and pumping the water 70 feet above the surface, or in all about 130 feet. The size of this pump is four inch diameter, eight inch

smoothness of the operation enables the horse to do more work than he could if compelled to undergo a continual jar and hammering, which the single cylinder pump necessitates. Mr. Smith asserts that this pump can be run up to the same piston travel as the steam engine.

The pump we saw in operation at Mr. Smith's shop has four cylinders, two inch bore and two inch stroke, the same as that shown in Fig. 1. When we saw it in operation it was running 150 strokes a minute, under 500 pounds per square inch pressure, equal to over 1,000 feet elevation, and there was no perceptible noise or jar whatever. The stream from the discharge pipe flowed steady, with no break or eputter.

A NEW STEAMBOAT BOILER.—The Government Board of Supervising Inspectors of Steam Vessels, in session in Washington, has authorized the use on steamers of twenty-five tons burden and under of a new boiler, provided its pipes shall not exceed two inches in diameter. This boiler is the invention of Mr. Harnesboff, of Rhode Island, and is composed of coils of iron pipe enclosed in outer casing; the coils are set over an ordinary grate; the feed water is forced into the upper-end coil and is converted into steam in its descent; the steam is conveyed into a receiver outside the boiler, from which it is taken to the engines. The lower end of this receiver is supplied with means for blowing out sediment that may be collected. The board was satisfied with the utility of this boiler for marine purposes, within certain limits of construction, as given above. It is thought that the boiler can be used successfully and safely on the smaller class of steamboats, such as ply upon our rivers.

A BILL has been introduced in Congress declaring the Reading military reservation, in Shasta county, California, subject to pre-emption and homestead entry.

Quicksilver Furnaces.

[Written for the Press.]

It is certainly a strange but incontrovertible fact, that with all the advance made in applied chemistry to the arts and sciences, the manner of building quicksilver furnaces should remain almost in the same state for years and years, little or no improvement being made in them.

It is true many modifications have been made, but still the principle is adhered to that has been in use in Almaden (Spain) for years past—that of treating a valuable ore of metals in the same manner that limestones are burned, by passing the fire directly through the mass—with what result, those who have given any attention to the matter know too well, the product bearing no proportionate result that should be obtained by proper manipulation.

The only improvement—if such it can be called—made on the old manner of working, is that instead of being intermittent in charging and discharging the furnaces, it is now made continuous; but still this barbarous treatment of the ore is continued by "burning the rock," properly so called; for the object does not appear to be how to obtain the quicksilver, but how much heat can the ore be made to bear. Now, no one doubts that every particle of the ore has been thoroughly burned, and the sulphide decomposed, but where is the quicksilver? Certainly the amount that should be in the condensers is not to be found in them; and its place is occupied by a white substance, mixed with the material usually called soot, and both are, as a general thing, lost in washing.

From a series of experiments, made some years since in Almaden, Spain, extending over a period of six months each, the best results obtained were 60 per cent. of the assay value. Upon these results being known, they adopted retorts for working the cinabar, and thereby much better results were attained. Now, this certainly demonstrates one thing, that the crude and unscientific manner of treating the ore, (in a lime kiln fashion), had this one great defect, that the loss of metal was and still is very great and ruinous; but when the ore is rich, the production of quicksilver is so abundant no notice is taken of this waste of metal. These facts remain at this present time where the manipulation of the ore is carried on in the same manner or the modifications mentioned.

It is now proposed to show how, where and under what condition this loss occurs: The combustion of sulphides produces, by the action of air and moisture, sulphuric acids—in fact, it is produced without the aid of the moisture, from the presence of sulphuric anhydride, and taking the oxygen from the ferric and other oxides formed. The action of this hot sulphuric acid on the finely divided mercury, as it is eliminated from the ore, causes the metals to be vigorously attacked and converted into a sulphate, and this substance is carried along by the draft and deposited in the condensers, combining with the soot, and as a general thing washed away, thus occasioning the great loss referred to. As a further proof of the abundance of acid formed, this destruction of the iron condensers, now in use, fully demonstrates.

CINNABAR.

JUDGING from the glowing reports published in the Eastern newspapers the Black hills diggings are turning out well. Twelve hundred men are said to be taking out \$1 per hour on an average to each man on Rapid creek, while four men in six hours recently took out \$137, and on the following day, at the same place and time, \$112. Nuggets worth \$20 and \$25 are not uncommon, and the field grow richer every day. The Indians, however, threaten trouble in the spring.

FLUCTUATIONS IN PETROLEUM.—Great have been the fluctuations in the price of petroleum. Since 1864 the monthly price at Titusville has been all the way from \$13.75 to 73 cents per barrel, and the average of prices has been from \$7.62 in 1864 to \$1.29 in 1874. Fortunes have been won but few have been kept. The suddenness with which those who were poorest of the poor have become millionaires, has only been equaled by the suddenness with which they have become poor again.

The Smelting Ores of Inyo Co.

A correspondent of the *Chronicle* says: The masses of the State have but little idea of the vast mineral resources of Inyo county, and hundreds of men have visited the county on running visits in the last five years that have not the least idea of its mineral wealth. The excitement of 1862 caused an investment by outside and reckless capital in mills and machinery, erected at a cost of about \$2,000,000, in a hurried and insane effort to reduce rebellious copper-bearing ores—an effort that was futile, of course. The failure was a complete check on the county for nearly ten years, until men of energy and enterprise uncovered the riches of the lead and silver bearing mines of Cerro Gordo. This was done with little or no outside capital; the few that personally took hold of the enterprise commenced poor, discovered after many failures the proper mode of reduction, and in a few years made themselves rich and brought wealth to the county, until to-day it can truthfully be said that there are more men of substantial means in Inyo county than in any other county in the State in proportion to the population. To-day Inyo's greatest promise is in

Her Lead Ores.

As such ores are found in almost unlimited quantities, and the method of reducing them with a large margin for profits is well understood. If the Fryer process becomes a demonstrated success, so it can be used without too large a royalty to the patentee, and even if it is a success at a cost of eight times the assumed expense of reduction of rebellious ores, Inyo will be able to turn out from her rebellious ores more silver than from her galena ores that are now giving her a reputation as a mining county. I notice that the "mineral statistics" of the coast gives Inyo county credit for a product of \$2,000,000 of silver bullion for the year 1873. The public may be surprised when I inform them that this product was the result of smelting by two small furnaces only, and from a mine that to this time has been developed to the depth of only 500 feet, with only one year's product out of four accounted for. The discovery of lead mines in and about Darwin within the last fifteen months has brought to light great deposits of ores as easily reduced by

Smelting as in Cerro Gordo.

That are capable of increasing the annual product of silver in Inyo an hundred fold. To say that Inyo county could ever produce \$200,000,000 of silver bullion annually may seem to be stretching the truth; but it is not without bounds. Let Cerro Gordo mines be examined; they have already furnished the proof of \$2,000,000 annually; then contrast them with the mines of Darwin, and any one with ordinary calculation will say that with the same management and energy given in working the Darwin mines they will without question increase the product an hundred fold. Three furnaces are to-day running at Darwin. I am told that they produce each 200 bars (of eighty pounds to the bar) lead bullion per day, of an average assay value in silver of about \$300 per ton. If these enterprises are not profitable it is because they are run by incorporations that call for a dividend on stock issued to the amount of \$10,000,000 in each enterprise. Defiance mine is running one furnace, the ore smelted is mined by three men, and twenty or fifty men employed on the forty-foot vein exposed could mine ore sufficient to produce 1,000 bars of lead bullion daily.

Yuba County Gravel Mines.

A correspondent of the *Resources of California*, writing from Smartsville, Yuba county, says: This is indeed a smart mining camp—a good, lively, prosperous, and very promising town, of say 600 people, located just in the foothills, half way from Marysville to San Juan North, 20 miles from each place, 14 miles from Wheatland, 16 from Grays Valley and 18 from Nevada City. This is purely a mining town—its interests absorbing Timbuctoo, about one mile west, Mooney's Flat, one and a half miles east, and Sucker Flat, one and a half miles north. Smartsville is growing—new houses are going up and old ones are being repaired. While the business of the other little places named has been concentrated in Smartsville, they are still the residence of many families, being convenient to the mines. The location of Smartsville is pretty. It is a cheerful, pleasant place, with two churches, a nice public school, costing \$5,500, including house and grounds, with a library of 400 volumes, and ably managed by three efficient teachers, on salaries of \$100, \$70 and \$60. Here are 234 census children. The town has two hotels, two stores, two drug stores, two livery stables, one meat market, one tin and stove store, one blacksmith and wagon shop, one shoe shop and one barber. This town has boasted of eight incorporated mining companies. It is all hydraulic mining, and the operations are among the most gigantic in the State. To indicate the value of these claims, we will state that the secretary's books show that from Timbuctoo to Mooney's Flat, in a space of less than two and a half miles, there has been taken out nearly \$30,000,000; and if the gigantic operations already inaugurated and in process of construction, be carried out, fifty years of incessant labor will not exhaust these great and rich gold bearing gravel beds.

The Blue Point mining company have run a tunnel 2,270 feet, to run the gravel through, at a cost of \$146,000. This claim has paid as

high as \$2,300 per day, and has paid \$18,000 in dividends monthly.

The Bline Gravel mining company has run three tunnels, costing \$75,000, \$60,000 and \$50,000 each, about 1,600 feet long. They have taken out as high as \$2,000 a day, and have paid in all, \$800,000 in dividends.

The Rose Bar mining company have just completed a tunnel 1,400 feet long, which cost \$80,000, and have now commenced an extension 150 feet long, with a branch tunnel 600 feet long, using the new diamond drill cutting out a core of the rock. It drills one and a half inches in a minute by water power.

The Smartsville hydraulic mining company have taken out \$550,000. They will have to run a bedrock tunnel, or work through another which they can purchase.

The Pactolus mining company have run a bedrock tunnel 1,300 feet, costing \$60,000. Their claim pays \$800 a day every day it is worked.

The Enterprise mining company run a tunnel 80 feet above the bedrock, which cost \$60,000. The dirt washed through this tunnel pays well. They intend to run a bedrock tunnel.

The Deer Creek mining company, at Mooney's Flat, are running a tunnel 3,500 feet long. They are in 1,000 feet, making, through very hard rock, with the Ingersoll drill, 20 feet per week, in a tunnel eight by eight. This company's claim embraces 350 acres of rich gravel.

One of the largest and heaviest operators in the State is the Excelator water company, J. W. Pearce, president; Geo. P. Thurston, secretary, office, 313 California street, San Francisco; E. S. Thurston, engineer and secretary at Smartsville. This company owns all the water right here, having 110 miles of canals and ditches, with a carrying capacity of 8,000 inches, miners' measure. They bring to this place an average of 5,000 inches per day. They bring their water from Deer creek, Squirrel creek and the three Yuba rivers. They sell \$150,000 worth of water per year, at ten cents per inch, or for irrigation at \$10 per acre. This company own all the mines at Timbuctoo, seven-tenths of the Deer creek company's claims, three-sevenths of the Blue Point company's claims, three-fifths of the Smartsville hydraulic mining company's claims, besides other smaller interests. They have an iron pipe forty inches in diameter one and a quarter miles long, costing \$60,000. They own twenty-five miles of telegraph line, running to various points in these claims. They have just purchased 2,000 acres of land below here on the Yuba, and intend to irrigate and cultivate it, and will go largely into fruit, especially semi-tropical fruits.

On the Empire ranch, one mile above town, Mr. Thomas Mooney's, we saw several hundred fruit trees growing, all the northern varieties and some of the semi-tropical doing well. This ranch embraces 240 acres, 200 susceptible of cultivation. It is devoted principally to hay. We have been much interested in our visit to this mining town. An excellent road from Marysville and a splendid line of stages therefrom and only twenty miles distant affords a rare opportunity for any one to see some of the heaviest mining operations in the State. The gold bearing gravel channel here is a very hard cement, which requires blasting before hydraulic mining, and as high as 2,200 kegs of powder have been charged in one blast. Some government land can be bought at from \$5 to \$10 per acre. At least sixty acres of a quarter section on an average will be found suitable for cultivation and the rest for grazing and wood. Here is plenty of water for irrigation. Those who have tried it say they can make money on every acre they cultivate, even by paying \$10 per acre for a year for irrigating their lands.

The Mines and Workmen.

We understand that quite a number of the prominent miners of this camp, backed by responsible merchants, have made a proposition to the companies interested to lease some of the mines on War Eagle mountain, in order that the workmen to whom the companies are largely indebted can have an opportunity to make subsistence for themselves at this unpropitious season of the year. The companies will be subject to no sacrifice in acceding to this arrangement. On the contrary, they are liable to be gainers, as we understand that the parties who propose this thing are willing that the surplus proceeds from their operations shall be applied to paying off old claims or cancelling the most urgent debts in which the companies are interested. The closing down of many of these mines is liable to be attended with most disastrous consequences, as workmen are unable to get away from the camp, and must soon be in want, unless something is done for their relief. Added to this, business of all kinds is liable to come to a standstill. There are responsible men here who are willing to make some sacrifice in order to show that the cause of recent drawbacks is not in the mines themselves, but in their defective management. There are now several hundred tons of rock at these mines on War Eagle mountain awaiting crushing, and with what can be taken out during the winter months, we are satisfied that sufficient bullion can be produced to keep the camp in a comparatively good condition for the remainder of the winter, as well as assisting the companies in the removal of incumbrances that now exist.—*Idaho Avalanche*.

SENATOR JOHN P. JONES has purchased the controlling interest in the Eureka mill, the largest on the Carson river, and by many considered the best in the State.

The Mining Debris Question.

In the last issue of the Oroville (Butte county) *Mercury* was published the memorial and resolutions introduced into the Assembly by Mr. Berry, of Sutter county. They have appeared in nearly every paper published in the agricultural portions of the State, and in a few of those where mining is carried on. The memorialists claim that all of the overflows and the filling up of harbors is caused by mining, and that therefore Congress should pass laws allowing mineral lands to be disposed of for the purpose of hydraulic mining, only upon such conditions as shall prevent injury and damage to the valley lands, rivers and bays of our State. By means of just such reckless statements as are contained in the memorial referred to, a large number of the people throughout the State have come to the conclusion that the mines are about exhausted, or at least that the gold taken out is of far less value than the injury done to land, rivers and harbors. The statement therein contained of the destruction of lands and the value thereof is wide of the mark. There is not a single man living in the vicinity of the lands damaged that will value them at one-half the price set upon them by the memorialists, or who will claim that but little more than half the land named therein has been damaged in the least. A great deal of mining has been done in this county since '49, when gold was first found here. Vast tracts of land have been sluiced away. At Cherokee, a strip over half a mile long, and in some places near 100 feet deep, has been washed away and sent down Dry creek, along the line of some of the best farms in the county. Yet with all the mining done, we can safely say that not over 1,000 acres of agricultural lands have been damaged in the least, and the whole value would not exceed over \$40,000. This, we say, is the extent of damage done in Butte since '49, by reason of carrying on the business of mining. Now let us see what amount of gold is taken out, and then if the injury is greater than the profit, we will join in the cry to shut up the mines, for that is just what the resolutions ask Congress to do.

A few days ago we inquired at the office of Wells, Fargo & Co., in this town, if they had any data by which we could learn the amount of gold dust and bars shipped by them from this place. E. W. Fogg, the agent, kindly furnished us with the following figures: Amount of bullion shipped by Wells, Fargo & Co.'s express from Oroville in 1873, \$1,235,323; in 1874, \$1,470,764; and in 1875, \$978,903; making a total of \$3,674,990 that has been shipped from this little town in three years. And yet Mr. Berry asks Congress to pass such laws as will lay an embargo upon our mines and virtually close them. Let some of our readers may suppose the mines are yielding less now than formerly, we will add that last year being very dry, but little mining was done except in those places where living water could be had. The gold sent from this place is far from being all that is taken out in the county. All of that from Forbeatown, Bangor, Evansville and some from Wyandotte, goes to Marysville and we get no account of it here. We hope our representatives and senator will carefully investigate this matter before voting for those resolutions, for Congress may think they are in earnest, take them at their word and pass the laws asked for, a thing which, if done, would forever seal the doom of this State. Close up the mines and this State would soon sink in rank and importance.

CHALOME VALLEY.—Our old friend, Dan Lee, from Chalome valley, called upon us last week. He informs us that the settlers there feel jubilant over their excellent prospects. They have had their share of the late copious rains, and the hills are clothed with an abundance of feed for stock. The mines of that district are exciting the attention of San Francisco mine dealers and stock buyers. The Nevada quicksilver mining company have a furnace in operation, and it is found that the ore is rich in its yield of mineral. The hill ranges of Chalome, in the estimation of settlers and others, promise very rich developments of quicksilver, coal, iron, gold, silver, manganese and antimony. The indications are favorable to the early extension of the railroad in that direction, as the engineering advantages of the Paronia pass route makes it the preferred route of the railroad company. As soon as the railroad enters Chalome valley, the mining interests of the settlers will prove of great value. The Secretary of the Red Rock coal mining company has issued a large number of shares of stock to the settlers of Chalome and San Luis Obispo during the past month. Samples of the coal have been forwarded to Hollister and San Francisco, and we are informed from reliable sources that this is the best coal discovery made to date on the Pacific slope. Mr. Stone and several men are now tunneling this inexhaustible coal bed.—*San Benito Advance*.

BELMONT MACHINERY.—From what we consider reliable authority, we are enabled to say that the Belmont mining company is having manufactured in San Francisco machinery of sufficient size and strength that will enable it to sink and work the mine to a depth of several hundred feet below the present workings, which is about 500 feet. If the report is correct, and the mine is properly worked, from what we have learned of the property from those who are familiar with it since the first pick was struck in the ground, the Belmont will ere long become favorite stock.—*Belmont Courier*.

The Valley of San Juan.

A correspondent of the *Philadelphia Press* says: It is in the valley of San Juan where the ruins of ancient cities have been recently found, indicating that it was once the home of a people and of a civilization whose history is wrapped up in the unknown past. The ruins of a city are found scattered over a large section of country. Large rooms are often found cut out of the solid rock, and the locations evidently selected and arranged for the purpose of successful defence. Pottery and other useful implements are found in great perfection. The work and style of manufacture indicate a civilization fully equal to that which prevailed among the ancients or in Peru or Mexico at the time of the discovery of the American continent. It may be that these are the ruins of the Aztec race that were supplanted by the savage Indians, who swept down upon them from the North; or it may be that they are the ruins of a race as civilized as the peoples of the Old World, and who had a history, if it were known, as long and wonderful as the history of Greece and Rome.

One of the results of the topographical survey of the country, now in progress, will be to unearth these ruins and, if possible, make certain the character of a people who, however much civilized and enlightened, had a history about which we can only speculate with our present sources of information.

The Silver Districts

In the western part of the San Juan country are most easily accessible up the valley of the Rio Grande. The head waters of this great river are one hundred miles west of Del Norte, in the same range of mountains out of which the waters of the Animas and the south fork of the Gunnison flow south and west to the Pacific. Lake city is the center of the lake district, and is the county seat of Hinsdale county. It is situated on the south fork of the Gunnison, just below the point where Henaou creek comes down from the northwest. High mountains rise up on all sides of the beautiful park in which the town is situated. I was there in October, after the mining operations of the season were mostly suspended. About fifty buildings of different classes were in course of construction, and much life and activity prevailed. The *Silver World*, a good weekly newspaper, is published here, and the ability with which it is conducted has done much to build up the town and induce the development of the mining district. A mile and one-half above the town there is a perpendicular fall in the Gunnison of sixty feet. A short distance further up the stream there is another fall of 80 feet, and still further up, five miles above the town, is a beautiful lake from which the town and district are named. The lake is known on the old maps as San Christoval lake, and was discovered by Jesuit missionaries. The mines of this district are chiefly found along the sides of the mountains bordering on the lake, and on the stream down to and below the town and up Henaou creek, for 20 miles toward the head of the Animas and the Uncompahgre. I spent five days among these mines gathering specimens from some of the best known. The veins generally run from northeast to southwest, are well defined, and many are exceedingly rich in silver. Some of the veins are narrow, but most of them are wider than the mineral veins of Northern Colorado, and the assay value of the ore is nearly 100 per cent. higher on an average. The Hotchkiss mine yields both gold and silver, in about equal parts, and the ore taken from the richest pay streak, five inches wide, will run as high as \$15,000 to the ton. This mine has a tunnel over 120 feet long, and work is now being pushed forward with considerable energy. After a careful examination, I do not believe the Hotchkiss mine is in any way superior to many others in the Lake district.

FROZEN QUICKSILVER.—The last cold snap was the severest ever known in the vicinity of Carson river, a most singular incident being the freezing of the quicksilver in use at the reduction mills. At the Eureka mill, running 60 stamps and situated in a gorge where the west wind rushed through day and night like the current of air passing out of a blow-pipe, it was noticed that the quicksilver pump had ceased to perform its proper functions. The powerful machinery of the pump continued to work, but no quicksilver was raised to the pans on the first floor. After passing through the pans, settlers and strainers, the quicksilver goes down to the lower floor of the mill, and is then collected in a tank about four feet square, from which it is pumped up to renew its round through the pans, settlers and strainers. When the pump failed to bring up quicksilver some of the workmen went down to the lower floor, expecting to find that the tank had sprung a leak. They found the quicksilver all there, however, but greatly to their surprise it was frozen solid. The pump being useless they got a spade and chopped the quicksilver up into cubes, which they then carried up to the pans with ice books.

A DOUBLE-TRACK narrow gauge railway is now being laid in the exhibition grounds at Philadelphia, for the purpose of transporting visitors from one building to the other. The track is nearly six miles in length, and runs close to all the principal buildings. The motive power will be steam, with a dummy engine of improved pattern, and cars of the most luxurious description. These cars will be operated by the West End passenger railway, and a fare of five cents charged for the trip.

SCIENTIFIC PROGRESS.

A Novel Lecture on Electricity.

Prof. Tyndall recently delivered at the Royal Institution, London, a lecture on electricity, which presented some interesting and novel features for the lecture room. The novelty consisted chiefly in simplifying all the apparatus connected with the lecture, so that the experiments could be repeated with such simple and inexpensive appliances as were within the easy reach of any person.

As examples, the Professor did away with brass balls by substituting apples; and instead of insulated glass rods to support them, he employed sticks of sealing wax. When he required a long conductor, instead of using the ordinary brass rods and wires of an electrical machine, he substituted a carrot; and in one of the experiments where two hemispheres were required, he used the halves of a turnip. He said that he did not know what philosophical instrument makers would think of this plan of doing away with the "pomp and circumstance" of experiments by the introduction of simple apparatus—a remark which was received with applause by the majority present.

In the course of his lecture, Prof. Tyndall stood upon an insulating stool, and made his assistant, Mr. Cottrell, who remained upon the ground, pass a comb made of india rubber 20 times through his (Prof. Tyndall's) hair. The lecturer then placed his knuckles near the end of a long wooden lath balanced on the top of an egg, but the hand did not attract the rod. He explained that to get an electrical effect, the electricity upon the comb ought to have been removed by his assistant before each fresh stroke was made through the hair. Mr. Cottrell then made another 20 strokes with the comb through Prof. Tyndall's hair, and passed the comb between his own fingers before each stroke. The result was that the body of the lecturer became so strongly electrified that the wooden lath was attracted and began to spin round when his hand was placed near it. He illustrated the nature of electrical conduction by a repetition of the experiments once made by Stephen Gray. In the course of his illustrations one of the boys from the audience was placed horizontally upon a wooden plank suspended by silk cords; when an electrically excited glass tube was held over the legs of the boy, a lever arm of straw placed near his head, to serve as an electroscope, was drawn down by the induced electricity. In another experiment he held a glass tube near an insulated boy, and the electrical disturbance proceeded through a long copper wire suspended round the theater by means of silk threads until it reached the further end of the wire, which was attached to a gold-leaf electroscope. Every time the glass tube was placed near the lead, the disturbance passed through the wire, and the leaves of the electroscopes diverged. By these and other simple experiments he sustained the interest of his listeners for the hour during which the proceedings lasted.

A Newly Discovered Force (?)

The scientific world, just at the present time, is considerably exercised about an alleged "new force," thought to have recently been discovered by Mr. T. A. Edison, a well known telegraph engineer and inventor, of Newark, N. J. One mode of producing a manifestation of this force is given by the *Scientific American*, as follows:

Upon an insulated table place an ordinary Morse key and an electro-magnet, the coils of which are so wound that no magnetism is produced in its cores by the passage of an electric current. Use for an armature a piece of the metal cadmium, to one end of which fasten a flat spring. The other end of the spring attach rigidly to a standard fixed on the table. Adjust the armature a short distance away from the core of the magnet. The standard is to be connected by wire to one end of a glass rod or tube, say two feet long. The other end of the tube connects by wire with a graphite point (a lead pencil will answer). Another graphite point is connected by wire to a gas pipe or other suitable mass of metal, not in contact with the apparatus; and the two points, in position similar to the arrangement for producing the electric light, may be placed in a box from which light is excluded, but with a hole in the top for observation. Place 10 or 15 Bunsen cells in circuit with the key and the coils in the usual manner. Now, if the key be closed, a spark of considerable brilliancy will be evolved from the graphite points, but possessing no continuity. If, however, (the battery circuit remaining closed), any part of the connection between the gas pipe and the cadmium is broken, and contacts be made either slowly or rapidly between the disconnected points, the spark reappears at each contact.

It is here that the phenomena are surprising, and apparently inexplicable. The graphite is not in the battery circuit, nor in any other. Moreover, it is separated from the rest of the apparatus by the glass tube. This alone would seem to prove that the force is not electrical, at least as the term is generally understood; and when supplemented by the fact that the most delicate galvanometer and the chemicals most sensitive to the electric current fail to note its presence, this conclusion must be accepted.

Many experiments have been made with a

view of obtaining some definite knowledge, but nothing has been developed beyond the facts above stated, and in addition that, like electricity, the new force passes through or over some substances better than it does over others, and also that, as the resistance of one of its best known conductors is increased by length the spark decreases in brilliancy.

All the manifestations thus far obtained have been of the feeblest kind, so feeble indeed that the current cannot be made to make a record sufficient to allow of its use for telegraphic or any other yet known practical purpose.

It does not seem to be either magnetic or electric, although pertaining to the nature of both. Mr. Edison called it "etheric force," but for what reason does not appear. At first, efforts were made to connect it with Reichenbach's "odoric force." It was also referred to what were denominated "weak sparks" of electricity, discovered several years ago, by Prof. Reiss, of Germany.

But the phenomena connected with this new manifestation, when carefully studied, do not seem to admit of either reference, and scientists are inclined to acknowledge that Mr. Edison has really made a discovery which has heretofore escaped notice.

Dr. Beard, however, is inclined to think that the phenomena may be due to a peculiar form of electrical induction, and that it is, after all, only a new phase of electricity. Mr. Edison prefers to consider it rather a new form of heat or light, rather than of electricity.

The weight of evidence, according to George M. Beard, M. D., in the *Scientific American*, is in favor of a new "radiant force," somewhere between light and heat on the one hand and magnetism and electricity on the other, with some of the features of all these forces." He would place it nearer to magnetism and electricity than to light and heat.

One of its peculiarities is that while electricity prefers to pass by points, this new force appears to prefer to pass through or over large surfaces; thus a large surface of tin foil, several inches square, will conduct it from one mass of iron to another more readily than will two points projecting toward each other from the two masses of iron.

It does not respond to any of the physical tests of electricity, except the spark.

It produces no physiological effects upon muscular tissue, as does electricity.

Glass, rubber, paraffine, dry wood, etc., which are non-conductors to electricity, are very good conductors to this new force.

It passes quite readily over non-insulated conductors—as along a wire laid upon the ground.

For this latter reason it was assumed at first that it might possibly be used for sending messages by uninsulated wires buried in the earth or in the ocean. But no facts have been developed which warrant any such assumption. Indeed, as yet, no practical application can be seen for this new force—if such it is. Scientists will watch with much interest for further developments, and it cannot be doubted, whatever the final result may be, that the earliest investigations now in progress must result in an important extension of our knowledge of the phenomena under discussion.

Birds With Teeth.

Late fossil discoveries have fully shown that birds having perfectly developed teeth, in sockets, have existed on the earth. Birds, owing to the destructible nature of their remains, are among the rarest of fossils, and none are known to have existed earlier than during the cretaceous formation, the three-toed footprints found in the triassic being probably all made by the huge saurian reptiles of that age.

The fossil remains of the first species of birds discovered, which were unmistakably provided with teeth, were described by Prof. Marsh, in the *Am. Jour. of Science*, in 1872. One of these specimens was fortunately in a remarkable state of preservation. It was an adult bird, about as large as a pigeon. The skull was of moderate size; the lower jaws long and rather slender, in each of which are twenty-one distinct sockets. The upper jaw also contains teeth. The teeth remaining in the sockets are small, compressed and pointed, are all directed more or less backward, the upper portion being covered with enamel.

The remains of several other species of birds with teeth have since been discovered, the most interesting of which is a gigantic diver. Some of these birds with teeth were such as lived almost exclusively on the water, being provided with only the rudiments of wings, but having powerful swimming legs and feet. Birds with teeth have been divided into two classes—first, those having their teeth in sockets, and second, those with teeth in grooves. All these discoveries have been made in Kansas, by Prof. Marsh and the Yale College exploring party. The fossils have been placed in the Yale College museum.

Methods for hardening glass are now one of the favorite studies of inventors. Mr. Macintosh, of London, finds that by enclosing fused or pasty glass in platinum molds of the desired shape and then suddenly cooling it by any frigorific mixture, the glass becomes exceedingly hard. Glass can be made harder than the diamond, and its powder be used instead of emery powder or diamond dust. Artificial gems of the proper hardness and of adamantine luster can be made.

THE LION "A PRETENTIOUS HUMBUG."—The lion has generally been considered as king of beasts, more probably by reason of his more royal and majestic appearance than in consequence of his superior strength. But the tiger is really the most agile and powerful of the two. This statement is concurred in by all who are intimately acquainted with both animals. It is said that five men can easily hold down a lion, while it requires nine to control a tiger. It is also well known that anciently the tigers almost invariably killed the lions in the amphitheaters. The Rev. Samuel Houghton, in his book on "Animal Mechanics," shows that the strength of the lion, in the fore limbs, is only 70 per cent. of that of the tiger, and in the hind limbs only 60 per cent. The same writer remarks: "The lion is, in truth, a pretentious humbug, and owes his reputation to his imposing mane, for he will run away like a whipped cur, under circumstances in which a tiger will attack and kill."

MECHANICAL PROGRESS.

The Mechanical Age.

The London Times, criticising Lord Derby's Manchester speech, says:

However quick other countries may have been to develop the great mechanical discovery of the century, it is to England that those discoveries are mainly due; and our riches have been derived as much from the genius and patient intelligence of men like Stephenson and Faraday, as from our stores of coal and iron. But until recently manufactures and machinery were regarded very much as outlying provinces of human energy, which might be left to take care of themselves. They brought wealth to the country and fortunes to individuals, but they were regarded as no more a matter of general concern than any other trade. They are now recognized as a kind of public care; and even in his capacity of Foreign Secretary, Lord Derby was invited at Manchester to treat them as of primary importance.

Without going the length of Dr. Playfair the other day, and treating the natural sciences as almost a substitute for all human culture, it is evident that, as a matter of fact, all culture is being brought to bear upon them, and that they are absorbing energy and attracting thought in every sphere of life. In view of this remarkable revolution of thought one is a little provoked by the very matter-of-fact reasons which are usually alleged in explanation of it, and Lord Derby, in the greater part of his Manchester speech, was too true to his habitual caution in contenting himself with reiterating them. Labor, he says, is dear, and is becoming dearer; and it is consequently more and more necessary to invent labor-saving machinery. Similarly, at Leeds, the other day, even the apostles of science could find little more to tell us than that other nations are threatening to undersell us, and that we need all scientific appliances to hold our own.

All this is, no doubt, true, but the reality is too vast and broad to be adequately represented by such statements of the case. To say that we must invent better machinery because labor is dear, however accurate, is nevertheless something of a reversal of the order of facts. What has made labor dear in England? Above all, the invention of machinery. A machine is only matter animated by intelligence; and it is not merely because the wants of men have grown more numerous, but because their intellects have grown more active, that they have at length reached a stage of their development at which they are concentrating their energies on asserting the dominion of intelligence over Nature. It is this which is implied when we call the present a mechanical age.

THE USE OF BELTS.—A correspondent of the *Scientific American* says: "After many years' experience with belts of all kinds, I have learned that it will require the most power with the short, tight belt, especially if the pulley receiving the power to be much smaller than the one giving it. With the tightener there is a greater length of belt brought in contact with the pulley, consequently the belt can be much looser, and thereby lessen the friction upon the bearings. The tightener should be only heavy enough to take up the slack of the belt, which should be quite loose when relieved of the weight of the tightener, which should always be close to the pulley receiving the power. If the power is carried horizontally the long and loose belt will have a similar effect, as the slack of the belt will always be found on the side of the belt going from the giving to the receiving pulley, which will, if it be the top side, act so as to bring a much greater length of belt in contact with the pulley than in the case of the short, tight belt."

A PERPETUAL CLOCK RUN BY ELECTRICITY.—We have heretofore made mention of the perpetual clock, the invention of Mr. E. Clark, of this city, and spoken of his having applied for a patent. This patent has been granted, and Mr. Clark is turning out these time-pieces as fast as he can, but the demand is far greater than he is at present able to supply with the

facilities now at his command. These clocks are run by electricity, and consequently the trouble of winding up is obviated, the machinery running until it wears out. We noticed one the other day that had been running steadily since April, although the works had not been boxed in, the dust not having the effect of causing the slightest variation.—*Paris (Ky.) Kentuckian*.

Phosphor Bronze.

Phosphor bronze, which has recently been introduced with some éclat as an alloy of copper and bronze, proves not to be an alloy, but a true chemical combination of copper with phosphorus, or a phosphide of copper in definite proportions. The union of the two may be through the cold or the hot process, the cold sufficing for certain applications, being preferable indeed to combinations produced by heat. By the hot process the introduction of simple bodies other than the metals or metalloids is prevented. The copper used in the process must be commercially pure. Of the three kinds of phosphorus the operator may take his choice; the ordinary, the amorphous, and the earthy biphosphates. The amorphous is the most expensive, and is also the best. According to Delatol, the percentage of phosphorus varies from two to four, between which there may be an infinity of degrees, although for industrial purposes five varieties meet all the requirements. These are formed with two per cent. of phosphorus, two and a half per cent., three, three and a half and four per cent. Above four phosphor bronze is useless, but between three and four per cent. the material is claimed to be superior to any other metal or alloy. The price of phosphor bronze, unworked, should not exceed that of copper more than ten per cent.

With regard to the patents which have been taken out for the manufacture, it may be remarked that phosphor bronze and its uses as a compound dates far anterior to both the American and European patents. Both the cold and the hot phosphorization of copper was known and well described 25 years ago.

Overman, in his *Metallurgy*, New York edition of 1822, page 638, describes hot phosphorization in the following words: "Phosphorus renders copper very hard, brittle, fusible and oxidizable." A very little of this substance melted together with copper causes it to be very hard, similar to steel. Here is all that is known of this compound today. Cold phosphorization is described in the following: "Clean copper, held in the vapors of phosphorus, is successfully hardened." Years ago in our metallurgical practice, says *Mines, Metals and Arts*, we made phosphides of copper, lead and tin, and arseno-phosphides of copper and antimony, both by melting the metals, and also from the ores.

The author cited above, says, (page 430) "Phosphorus combines readily with most of the metals, and adheres tenaciously to them."

We may reasonably expect phosphorus in any metal which is smelted in the presence of phosphoric acid and carbon and hydrogen. Therefore the presence of bones, or bone ashes, in an ore or in a slag, will cause the metal to contain phosphorus. The best means for forming a phosphuret, is to heat a phosphate in the presence of carbon. Phosphorus is more easily oxidized than sulphur, and combines in this condition readily with the alkaline earths. We may, therefore, by these means, remove phosphorus. It also causes metals to be very fusible, more so than any other substance, and thus disposes them to be brittle when cold."

Foundry Charcoal.

The part which the charcoal plays in the molds is to give porosity and facilitate the escape of the gases and steam caused by the molten metal. There are three sorts in use in French foundries, known as mineral charcoal, vegetable charcoal, and stove charcoal. The first of these is made from coal finely pulverized, and is mixed with the sand used for casting pieces of small dimensions and little thickness; these are called green sand molds. But all sorts of coal are not equally good for the purpose; some kinds give a white appearance to cast iron, and produce on the surface, and chiefly at the extremities of the castings, rough spots which the file will not touch, and which have the appearance of having been run at too low a heat. M. Melifert has tried many kinds, and finds that *gras* or bituminous coal is the best, and says that, when used in small quantities and finely sifted, its action is perfect, and it gives to the casting that bluish luster which is highly esteemed.

The vegetable charcoal is made from carefully selected wood, burned in a special manner. The principal quality demanded in it is that it shall not take fire, and it is used principally for powdering the surface of the mold, so as to prevent the contact of the molten metal with the green sand. It is reduced to such impalpable powder that the spatula used for spreading it in the mold gives it a surface almost as brilliant as glass; it is called *gras*, or fat charcoal, a quality derived from the mode of burning, and it will neither roll before the trowel or spatula nor stick to it.

Stove black is used for the same purpose in the case of large castings, as the other materials will not bear excessive heat. This is simply mixed with water and applied rather thinly. A thick coating is not considered good.

Sales at S. F. Stock Exchange.

Table with 2 columns: Stock Name and Price. Includes entries like 100 Kossuth, 115 Alpha, 210 Best & Belcher, etc.

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SALES OF LAST WEEK AND THIS COMPARED.

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MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in the Mining and Scientific Press and other S. F. Journals.

ASSESSMENTS.—STOCKS ON THE LIST OF THE BOARDS.

Table with 10 columns: Company, Location, No. Amt. Levied, Delinq't, Sale, Secretary, Place of Business. Includes entries for Alta S M Co, American Flag M & Co, Andes S M Co, etc.

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Table with 10 columns: Company, Location, No. Amt. Levied, Delinq't, Sale, Secretary, Place of Business. Includes entries for Alameda Coal M Co, Albany Quicksilver M Co, Albion Quicksilver M Co, etc.

MEETINGS TO BE HELD.

Table with 5 columns: Name of Co., Location, Secretary, Office in S. F., Meeting Date. Includes entries for Bradford Cons Q M Co, Genesee M Co, Glasgow G & S M Co, etc.

LATEST DIVIDENDS (within three months)—MINING INCORPORATIONS.

Table with 5 columns: Name of Co., Location, Secretary, Office in S. F., Amount Payable. Includes entries for Alps S M Co, Belcher M Co, Belcher M Co, etc.

The Mining Share Market.

The present week opened with a market falling and at many points pretty thorough demoralized. The disaster to the Savage mine was used as a means to force down everything on the Comstock. The weather, too, had a dampening effect on holders of stock, and for several days the bears had it their own way.

A Stupendous Work.

The international committee on the construction of the submarine tunnel between France and England having reported the entire feasibility of the project, it is probable that the work of tunnelling under the Straits of Dover will be commenced at once, and pushed forward vigorously to completion.

Meetings and Elections.

Chester Flat Blue Gravel M. Co.—Feb. 8: Trustees, C. B. Pond, (President), L. Vesin, H. Stiel, H. Kozminsky, Chas. Waldeyer, (Superintendent), O. H. Bogart, (Secretary).

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

California.

AMADOR.

THE AMERICAN FLINT MINE.—*Dispatch*, Feb. 5: Among the many other important mining enterprises that are being carried on in our county, the American Flint mine, located near Fiddletown, deserves special mention, as it is destined to be one of the best paying mines of the kind in the county. The work is being prosecuted under the supervision of Col. W. W. Swindley, a man of undying energy, who has now 15 men employed in laying 60 yards of 15 inch pipe to convey water to the main bank of gravel, which is from 20 to 100 feet in depth, all of which prospects exceedingly well. This will afford an supply of from 500 to 1,000 inches of water, which, at a pressure of 240 feet, will enable them to wash out an immense quantity of gravel each day, especially as the modern appliances for hydraulic mining, including two "little giants," are to be used. The gravel, after being washed out of the main bank, will be run through a flume three-quarters of a mile in length, which will ensure a close saving of all the precious metal. The new pipe will be in position ready for work in a few days, when the owners of the mine confidently expect to reap a rich golden harvest, as enough gold has been taken out during the past few weeks to pay the expenses of the company, by simply piling the surface dirt in the range of the pipe already laid.

ITEMS.—*Ledger*, Feb. 5: The Downs hydraulic claim, situated near Humming Hill, about a mile above Sutter Creek, is in full blast. They have recently shifted the hydraulic to the west end of the claim, which is a much more desirable position than where it was previously located.

The Kennedy mine has resumed pumping operations. It is determined to keep the water from rising above the 400-ft level. Several teams are engaged in hauling water to the works, charging \$7.50 per cord.

The Amador Consolidated is again yielding rock from the upper levels. The ore is of high grade, and resembles one of the good times of yore. The air is still a long way from being good. The holding of water proceeds rapidly.

Sonoma has recently sold a gravel claim near Volcano to San Francisco capitalists for \$7,000. The claim embraces some 80 acres, and the gravel varies from six to 25 feet deep.

BUTTE.

GOOD PROSPECTS.—*Record*, Feb. 5: These who have had faith in the Butte creek mines for the past 25 years are about to see their dream realized, if we may judge from what has transpired lately. Within the past few weeks various parties from Chico have taken advantage of the dull times, produced by a rainy winter, to try their hands at prospecting the Butte creek mines in the vicinity of Centerville, Diamondville and Helltown. We saw on Tuesday a very pretty quantity of dust at the Bank of Butte County to the amount of about \$1,500, that parties had brought down with them as they came home to spend the Sabbath with their families. These familiar with the mines of that vicinity are confident that it only requires a supply of water to be brought in high enough to work the gravel banks in order to open a vast extent of good paying mines. The immediate bed of the creek has been worked over and over again, and it is the high banks that are now attracting attention. In many places these can be worked to a limited extent by the winter supply of water. It is by this that the present showing of dust has been made, and it seems probable that the locality immediately famous for the richness of the bed and immediate banks of Butte creek is to be more than repaid by the discovery of vast deposits of paying earth in the adjacent hill and mountains. Why gold should not be found in the hills above "the Forks" we do not clearly understand, for Bull creek is a tributary of Butte creek, much higher up, and has long afforded very rich mining. It may be that the chain of gold paying deposits is broken, but if so it is in the hills somewhere in that vicinity. It is also known that Gravel Range, a somewhat famous locality, still higher up, is rich in mineral deposits, and there is no good reason why paying mines of great extent should not be found. If so, the water to work them will be found in the tributaries to Butte creek.

CALAVERAS.

THE GWIN MINE.—*Chronicle*, Feb. 5: The 1100-ft level is progressing finely, having already been driven 45 ft. The ledge shows four ft in thickness, and is improving in quality of ore. One small battery is engaged in crushing.

EL DORADO.

DITCH ENLARGED.—*Mountain Democrat*, Feb. 5: The enlargement of the South Fork ditch, from Smith's flat to the reservoirs south of town, is now an accomplished fact. The enlargement has been made for the purpose of conveying the water brought down from the main trunk, through the lower ditch, to the company's mines in Conch hollow. It measures six ft in width on bottom, ten feet on top, and will carry over four ft in depth of water. All the old ditches have been torn out and replaced by larger and more substantial work. The aqueduct at the head of Cedar ravine has given place to an inverted siphon of 26-inch wrought-iron pipe, which passes under the old ditch, and the Waberditch, and has a pressure of about 40 ft between inlet and outlet.

ITEMS.—The St. Louis mine, Col. O. P. Johnson, superintendent, is still at work bringing up the golden ore and promises to take rank among the first mines in the State. The ore in this mine has always been of a high grade. We understand that reduction works will be started in the spring. The Partridge mines are running to full capacity, and successfully. Robinson's mine is expected to start up soon and renew its golden current. The Oregon mine is also being prospected with great results. The opening of the spring will give movement to all our mines, hydraulic, gravel and quartz.

INYO.

THE DEFANEO.—*Oso News*, February 3: Last week in our report of this mine we spoke of a "bonanza" having been struck in the middle ledge above the first level, north of the cross-cut, which gave every indication of being very extensive. Since that time they have been cross-cutting this deposit to ascertain its extent, and at the present showing the cross-cut has been run a distance of 40 feet through a splendid body of ore, and the ore still holds out. At the south chimney, on the second level, drifts have been run from both winzes into this chimney, through solid ore, and they struck about 50 feet of making the connection, which will, if the ore continues, make the bonanza 80 or 90 feet in length, its width not yet having been determined. In the last two or three days the north chimney has, for the first time on the second level, been tapped by a drift, and from this point the very best of ore is being taken. It is of high grade in silver and contains 55 per cent, in lead. This is a wonderful mine, and in all points where exploration have been made more than meets the expectations of its owners.

BIENELL AND STONEWALL.—From C. W. Honaker, who is superintending the work, we learn the following in regard to these mines: A contract has been let on the Biennell—which is situated about one mile east of Darwin and near the Keystone—to sink on the ledge ten feet, and as much further as may be necessary, to ascertain the value of the property. The croppings are

from 4 to 30 feet in width, with all the external indications of the ledge going down to a great depth. It is believed that both mines will turn out to be good.

KATIE PEASE.—This mine situated about eight miles from Darwin in the northern end of the Argus range, near Darwin canon. Work was begun on the 29th ult. The ledge, which crops out on a bluff, was only six inches in width at the start. Some 20 feet below this bluff a cut was run in about seven feet, when the ledge was encountered, and at that depth the ore vein is 19 inches in thickness. The walls are well defined and are nine feet apart, the ore vein increasing in width as sinking progresses. The ore is of the free milling character. A contract has been let for sinking the mine on the ledge, and at that depth it is confidently believed by Mr. Kaufman, one of the owners, that a strong vein will be developed.

COGO CONSOLIDATED.—We have little to report in regard to the Bolla Union this week, as it is the desire to concentrate the work upon the double compartment shaft, which is being pushed as rapidly as possible. From the other workings of the mine more than sufficient quantities of wood ore have been and are being extracted to supply the furnace.

KERN.

A FLURY.—*Courier*, Feb. 5: A little flurry of excitement was caused a few days ago by the report that rich ore had been discovered near the town of Flury, about 14 miles from town. A number of citizens started out on Thursday morning to prospect the new find, and we await their return to learn the result. Persons who are familiar with the locality, however, are not at all sanguine of anything being found that will pay. The creek has, it is said, been prospected thoroughly year ago, and nothing was ever found to justify the claim. There are spots that will pay small wages, but most of it is almost entirely barren.

A CONTRAVENTURE.—Reports of the marvellous richness of the Bunnell mine near Kernville continue to accumulate, but the biggest thing they have on hand now is an adverse claim and a prospective expensive lawsuit. We have been informed that the mine was jumped by Morley last week. There are spots that will pay well with shotguns and other playthings. It is impossible for us to attempt to give the merits of the controversy.

MARIPOSA.

NEW PLACER DISCOVERED.—*Gazette*, Feb. 5: We have received the gratifying intelligence that the prospect of a new field of placer mining has been found in the southern portion of this county, near Hayfer's ranch. Our informant says that as high as \$20 a day was picked up, one place of the value of \$6. Quite a number of miners are already upon the spot, and we expect a host of good results from this new mining section.

PLACER.

THE MINING SITUATION.—*Forum*, Feb. 3: The severe snow storm which has been raging for the last fortnight had the effect of almost entirely suspending outside operations. All the claims in this vicinity were obliged to cease working excepting the Pacific, the banks of which, being composed of fine top gravel, are easily piped away. The various claims which require a derrick or hand labor to remove the rocks have been idly waiting for the storm to abate. At Gold Run the Judd and Cedar claims, which are both opening through bed-rock tunnels having only fine gravel to run, have been kept busy washing excepting a few days they were out of cleaning up in their tunnels. The tunnels and inclines which are being run in the bedrock here have not been affected, work on them having been continued with usual vigor. The water supply (owing to the snow and ice above), has been materially reduced, none of the ditches carrying half of their capacity.

TRINITY.

A VISIT TO THE ALTOONA MINE.—Correspondence of the *Journal*, Feb. 5: Passing Mr. Foley's, we came in full view of the Altoona mine and works. In company with Mr. Greenman, the superintendent, I went to the retorts—five in number—recently constructed and to all outside appearances working well, with a good flow of mercury and several flasks filled ready for market. The retorts are of the best construction, and are made of a high grade, from its blood-like appearance. The retorts and buildings look clean and neat, and show some mechanical skill in erection. Going into the mine I find that usual activity which indicates a paying property. Here we see the ore extracted from the vein in several places and delivered to the puddling and rolling places, preparatory to going to the retorts as 25 to 40 per cent, ore.

Nevada.

WASHOE DISTRICT.

CONSOLIDATED VIRGINIA.—*Gold Hill News*, Feb. 3: Daily yield, 650 tons of ore. There is no change in the rich character of the ore extracted or the favorable appearance of the ore breasts. The mills on the Carson river have been kept busy with ice but are now all running to their full working capacity. The shipments of bullion up to last evening amounted to \$1,805,000, and can be easily increased to \$2,000,000 by the 6th of the month if the company so desire, that being the date or time for declaring the usual dividend. The California mill is running splendidly, crushing ore from the mine, and will add greatly to its already enormous production. Sinking the C. & C. shaft is going steadily forward and will soon reach the 1300-ft level, at which point it will connect with the east drift on the 1500-ft level, now being run for that purpose. That drift being designed as a large working gallery is being pushed to completion as rapidly as possible, and is being timbered in the most thorough manner possible.

CALIFORNIA.—Sinking the C. & C. shaft is making the drift on the 1500-ft level, and is now down 1033 feet; the flow of water is quite strong, but is easily handled by the pumps. The north drift on the 1500-ft level has been connected with the bottom of winze No. 5 in the east cross-cut from the north drift on the 1500 ft level. This drift is now being continued north of the winze, the face still in rich ore.

OLD.—126 tons of ore. This ore is mostly taken from the 1500-ft level. The ore breasts are showing splendidly, and promise a good yield for a long time to come. Repairing the damage done by the water on the 1600-ft level, and in the east shaft below the 1465-ft level, is making steady and favorable progress. The foundation for a second air-compressor, also for a second engine, and for a second engine driving the saws and other machinery in the carpenter shop, is about completed. Both the compressor and the engine will stand in the main building of the works, the compressor on the south and the engine on the north side. Both will be in operation in three or four days. The new assay office is nearly completed, and will be in full operation in a very few days. The west shaft is now being run down to the 1500-ft level, and the shipment of ore to the Empire State mill was commenced last Monday. This mill will be started up to-day. Workmen are engaged in moving the temporary business office, preparatory to the erection on its site of a permanent and more commodious building. The new compartment of the shaft is fast approaching completion, the men employed in its excavation being engaged at no less than seven different points.

CROWN POINT.—Daily yield, 350 tons of ore. The ore is low grade and little more than pays for the cost of extracting and milling. Sinking the south winze No. 2 below the 1500-ft level is making excellent headway. This winze is being run to connect with the south drift on the 1600-ft level for air purposes, and is now down 55 feet. During the fore part of the week the south drift on the 1000-ft level, at a point 180 ft south of the Belcher line, encountered ore giving some excellent assays. The drift has penetrated into this ore belt about 15 feet, but has not yet gone far enough to determine its value. The main east drift on the 1700-ft level is being pushed steadily ahead through the ore

vein, the flow of water in the face being so strong that fears are again entertained that the work will have to be stopped until the flow subsides, on account of the pumps not being able to handle it. The main south drift on the 1700-ft level is steadily advancing to the southward, the face in good working ground.

SAYRE.—During the first part of the week the debris which had dammed the water flowing from the north drift on the 3200-ft level was removed, with the expectation that the pumps would be perfectly able to handle all the water that might flow from the drift. Contrary to all expectations, however, the water poured in until the pumps could no longer control it, and not only the incline but the 2300-ft level was completely flooded. The water continued to rise until the 2300-ft level of the Hale & Norcross was also flooded, and all work stopped in both mines. The pumps are running up to their full capacity, belasting about 20,000 gallons of water per hour. Large tanks are also being placed at work in the incline, and every effort is being made to reduce the flow of water as rapidly as possible.

BEACON.—Daily yield, 400 tons of ore. The ore here is of high grade, and it is expected will reach the 1500-ft level. The yield of the mills will not be so large for January as in December, owing to the clogging of the mills on the Carson river with ice, so that they could not crush up to the usual standard. This has caused an accumulation of some 3,000 tons of ore at the mills during the latter part of the month. The excavations for the new pump pit, and its expected will reach the 1500-ft level. The shaft is completed down to the 1500-ft level, and is now being continued on down to the 1600. A strong flow of water has driven the men out of the 1600-ft level and stopped all work in that portion of the mine.

SILVER MOUNTAIN.—Sinking the new shaft is going steadily forward, the bottom in good blasting ground. It is now down 100 ft, and it is expected will reach the 1500-ft level early in the next month. Both the north and south drifts at the 1250-ft level of the mine are steadily advancing, with no important changes to note. The south drift on the 1000-ft level is going rapidly forward, the rock in the face working quite tough and hard.

EDDY BRYAN.—The shaft is down 63 ft below the 500-ft level, the bottom in good working ground. The north drift on the 380-ft level is showing some very handsome quartz and ore. The south drift on the same level is steadily advancing, the face in quartz, with spots of good ore. Cross-cut No. 6, on the 250-ft level is showing a steady improvement. This drift has about 25 feet yet to run to reach a point under the ore body opened on the 170-ft level. On the 170-ft level, cross-cut No. 1 is steadily advancing, the face in excellent ore.

BULLION.—The northeast drift on the 2000-ft level is steadily advancing, the face still in quartz and porphyry mixed. No change in the operations on the 1700-ft level. The upraise from the 1700-ft level, to connect with the bottom of the main incline, is making good progress. Sinking the main incline is steadily progressing at the rate of about four feet per day. A waste and ore chute is being put in on the 800-ft level.

KNICKERBOCKER.—The heavy flow of water which this company has had to contend with for so long a time is at last completely mastered, and the shaft entirely cleared to show the 400-ft level. At the present rate it is expected that the shaft will be entirely drained, ready for sinking, in a very short time.

DAYTON.—Sinking the main shaft is pushed vigorously ahead, the bottom in good sinking ground. It is now down 28 ft below the 600-ft level.

AMAZON & GLASGOW.—The north and south drifts, on the third station level, are steadily advancing, the face of the south drift showing some fine sulphure ore. The north drift is also evidently approaching the ore body, the quartz in the face carrying more sulphurets and the ore is getting in increasing. The prospects of the mine are quite growing brighter.

OVERMAN.—Sinking the shaft is making slow progress, owing to the strong flow of water at the bottom. The main west drift on the 1100-ft level is steadily driven forward without change of interest. The pump-bath at the 700-ft level is nearly completed.

SUCCESS.—A very important strike of ore was made in the bottom of the shaft on the 1300-ft level, the surface, during the fore part of the week. The ore is of the white Comstock formation, and average assays give \$40 per ton, mostly silver. The extent of the ore has not yet been determined in any direction whatever, a breakage of the pumping machinery allowing the water to rise in the shaft to such an extent as to stop all work in the bottom. The damage will, however, be repaired in a very short time, and the sinking resumed.

ROSAUTH.—The main south drift on the 380-ft level is steadily advancing, the face in solid quartz. A cross-cut has been run from this drift a distance of 40 ft, the entire length of which is in quartz and ore of a very encouraging character. The main south drift on the 500-ft level is in 83 ft. The north drift on the same level is in a distance of 35 ft.

NORTH COAST VIRGINIA.—The 630-ft station and water tank is nearly completed. It is confidently expected that this tank will take up very nearly if not all the water in the bottom of the shaft, leaving it almost perfectly dry.

BUCKEYE.—Our report of last week had hardly gone to press before the news was brought that the fly-wheel of the driving engine had broken to pieces, greatly injuring the foundations of the machinery. This break has necessitated the shutting down of the engine, and the incline, flooding all the lower portion of the mine. The damages will be repaired and the water extracted at the very earliest moment possible.

JULIA.—The shaft is down 1650 ft, the bottom in excellent working ground. This is the new deepest perpendicular shaft on the Comstock lode. The main south drift is now down 1600 ft, and the sinking resumed, the face in ledge material of a very favorable character. The face of the south drift on this level is in fine quartz and ore. The main southwest drift on the 1400-ft level is in a distance of 782 feet, the face in soft ledge material of a very encouraging character.

UTAH.—The new pumping machinery is working with the utmost perfection, and the water has been drained from the shaft to a point 30 ft below the 400-ft level. The shaft is again in good repair to that depth. The station at the 400-ft level is badly caved, and a strong force of men are at work repairing the damage.

ORIGINAL GOLD HILL.—The ore dump being full, and the roads too bad to allow of hauling, ore extraction is temporarily suspended. The development of the mine goes ahead as usual.

JUSTICE.—South drift at the 1000-ft level continues in easy working vein material, with considerable water. Drift south at the 800-ft level in porphyry, clay and streaks of quartz which give low assays. The ore-stopes and breasts of the 600 and 400-ft levels are showing well.

PROCTOR.—Drift north has been started, following the west wall of the back ledge. It is running in very favorable vein matter, composed of porphyry, clay, and quartz which gives low assays.

UNION CONSOLIDATED.—The north and south winzes, on the 1300-ft level, are still being pushed downward, the bottom of both being in quartz and low grade ore. The cross-cut from the north drift, on the upper tunnel level, is steadily advancing, the face in a heavy body of tough clay.

IMPERIAL EMPIRE.—Daily yield, 30 tons of ore. The ore breasts are looking well, but that amount is all that the teams can haul to the mill. The north drift on the 2000-ft level is steadily advancing, the face in very favorable quartz and ore. The south drift is also advancing, the face in quartz and low grade ore. The bottom of the winze below the main tunnel is also looking well.

LADY WASHINGTON.—The 830 station and pump tank at that point are completed, the plunger is lowered

into position, and the pump column and rods are being lowered.

CHOLLAR-POTOSI.—The south drifts on the 1250 and 1350-ft levels are steadily advancing, without change of value to report. Daily yield of ore, 60 tons.

ROCK ISLAND.—Sinking the main shaft is making good headway, the bottom in good blasting ground. Cross-cutting a ledge on the 350-ft level is going steadily forward.

NEW YORK CONSOLIDATED.—The east and west drifts on the 800-ft level are steadily advancing, without change or interruption. This west drift is showing some very favorable streaks of quartz.

MEXICAN.—Sinking the winze below the 1465-ft level is making excellent progress, the bottom still in very favorable looking quartz and low-grade ore.

SULLIVAN.—The east cross-cut from the south drift has passed through the hard streak of porphyry mentioned in last week's report, and is now into the regular white ledge matter again. This is soft and easily worked and gives a better showing of quartz streaks than has yet been developed at this level, encouraging the idea that the eastern section of the mine will be rich in quartz streaks all carry more or less metal, and will assay from \$5 to ten in the hundred. They are simply little off-shoots, branches or feeders to a main ore vein which will be found some day.

SILVER HILL.—This new incline pump is in place, and works well. The main incline is down 70 feet in the new shaft, and is in the bottom of the north working well, and the Berlich drifts forcing the sinking ahead at a very rapid rate. The flow of water from the face of the east drift, at the fourth station level is still strong, but seems to be again gradually lessening.

HALE & NORCROSS.—The strong and steady flow of water from the north drift of the 2200-ft level of the Savage has raised in the Savage incline until running is now down 100 ft, and it is expected will reach the 1500-ft level of the Hale & Norcross, causing a complete suspension of work on the lower levels, until the water is checked in the Savage.

YELLOW JACKET.—The two east cross-cuts from the bottom of the north and south winzes on the 1940-ft level are steadily advancing, the face of each being in favorable working ground. No change is expected in any of the prospects or operations on the 1740-ft level or the north drift from the bottom of the north winze on the 1940-ft level.

BEST AND BELCHER.—Rotimbering the double winze below the 1500-ft level is finished to within about 30 feet of the bottom. The work is going ahead as fast as the pressure of the ground will permit. The water still stands to the depth of three or four feet in the north drift from the Gould & Curry shaft on the 1700-ft level.

CALEDONIA.—Sinking the main shaft has been greatly retarded during the past week by the heavy flow of water at the bottom. The large sinking pump has been again put at work in the bottom, and everything is now going forward as usual.

CONOVER.—The repairs to the machinery are not yet completed, but will be in a very few days, when drifting and sinking the shaft will be resumed.

GOULD & CURRY.—Repairing the main shaft is progressing very favorably. Otherwise there is no change of consequence in any other portion of the mine.

MINT.—The repairs and improvements in the shaft are almost completed, ready to resume sinking the main shaft.

SILVER CITY.—The raise mentioned in last week's report is now up 35 feet above the car track of the main adit level, and all the way in ore of high grade, especially at the top, where it is about six feet in width. Superintendent Henry is now breasting out both north and south, from the top of the raise, using it as an ore shaft. It is now far above the first one, and is not known at present, but he wishes to connect with the main ore stope south as soon as practicable, and also open out the vein northward. The ore developed at this point is among the best ever found in the mine.

BALTIMORE AND AMERICAN FLAT.—The main incline is being steadily crowded downward, the rock in the bottom blasting out finely. The incline pumping machinery is all in place, ready to start up.

NORTH CAREY.—Very good progress continues to be made in both sinking the main shaft and running the north drift. Good prospects at both points.

FLORIDA.—The grading and preparation for the erection of the first-class new hoisting machinery goes ahead at a very lively rate.

NEVADA.—Face of main north drift still advancing in porphyry and clay and streaks of low grade ore.

SURCO.—The main west tunnel is steadily advancing. The flow of water is light.

ALTA.—Sinking the main shaft is going steadily ahead. Otherwise nothing new.

PROSPECT.—Both shaft and drift driving ahead as usual, and promising well.

ROUGH AND READY.—Good progress made in sinking the new working shaft.

ELY DISTRICT.

RAYMOND & ELY MINE.—*Pioche Record*, Jan. 30: During the past week the pump has done some good work, keeping the main shaft dry. The working parties have been busily employed in cutting a tank station, sinking progressing but slowly in consequence. The extra pump rods have been placed in position and as soon as the tank is completed sinking will be proceeded with.

The upper levels are in a good state of being extracted, especially from the tenth level, from which place fine ore is being taken out. The shipments for the past week show an increase with plenty more in sight. The ore worked at the mill shows a very fair average and is easily worked. The present appearance of the mine is even better than it has been for the past eighteen months.

ALPS.—Since our last report no new development has been made in this mine. The gold-quartz ledge continues as before reported, a fair amount of ore being taken from it every day. This ore is held in reserve at present. In the balance of the mine work continues as usual. The upper portion from 15 to 20 tons of ore is daily hoisted to the surface. On the lowest level work is continued vigorously as possible, the rock being very hard and progress necessarily slow. The superintendent judges that they will have to go about 70 ft further before the ledge will be struck. The ore extracted daily is increasing in quantity and the appearance of the mine justifies what its owners have said.

ANASO VALLEY.—There is no change to report in the working of this mine, the work being continued as usual to the 1200-ft level, running the north cross-cut, which is being advanced rapidly. Chloride contractors are shipping fair amounts of ore daily to the Newark mill for reduction.

EUREKA DISTRICT.

THE JACKSON.—*Eureka Sentinel*, Feb. 6: Work is being vigorously prosecuted at the Jackson mine. Since work was resumed there the shaft has been sunk upwards, or rather downwards, 60 ft, and has now attained a depth of 350 ft from the surface. It is now a species of iron rock, which is considered a better indication of the proximity of ore than the slate in which it was running, until the last 20 or 30 ft. A drift is being run under the old ore body from the 300-ft level. In this drift a quantity of tolerably fine ore has already been struck, and any blast or stroke of the pick is liable to develop a body of ore, which has given the mine such a reputation a few years ago.

WARD DISTRICT.

THE ELKO.—*White Pine News*, Feb. 6: The parties who are working the lower end of the ledge of the Elko mine are taking out large quantities of high grade smelting ore, and are making a very good thing of their lease. There are a score of good properties lying idle in the district that could be made to pay just as well as Elko, and which could be had by making the proper application.

(Continued on Page 108.)

Value of Mining Property in Nevada County.

The Nevada Transcript has been favored by John T. Morgan with the following statistics from the assessor's office, which will be of interest:

The gross assessment of Nevada county for the year 1875 was \$7,893,547, divided as follows—Nevada township, \$1,342,215; Grass Valley township, \$1,984,830; Rough and Ready township, \$434,955; Bridgeport township, \$1,249,510; Bloomfield township, \$501,150; Washington township, \$180,835; Little York township, \$334,135; Eureka township, \$570,185; Meadow Lake township, \$1,295,732.

The following are the water and gravel claims of the county, assessed at \$10,000 and over: Milton mining and water company, \$381,660; Eureka Lake and Yuba canal company, consolidated, \$367,425; North Bloomfield gravel mining company, \$235,500; South Yuba canal company, \$167,600; Excelsior canal company, \$100,000; American mining company, \$80,000; Omega water and mining company, \$60,000; Birdseye Creek gold mining company, \$59,500; W. H. Dnyra mining claims, \$58,680; Little York water and mining company, \$53,150; Jacobs & Sargent water and mining claims, \$40,000; Sweetland Creek gravel mining limited company, \$40,000; Yuba Tunnel gravel mining company, \$30,000; Badger Hill and Cherokee G. M. company, \$30,000; Manzanita mining company, near Nevada City, \$28,500; English gravel mining company, \$25,000; Blue Tent Consolidated hydraulic G. M. company, limited, \$25,000; Liberty Hill mining company, \$18,100; Trust and Hope gravel mine, \$14,000; Smith, Alexander & Bell gravel claims, \$12,000; Blue Bank gravel mining company, \$10,000; total assessed value of all mining claims in the county in 1875, \$1,394,335; value of improvements on mining claims, \$457,815; total assessed value of mining districts, \$960,805; assessed valuation other than town lots, \$546,015; improvements on the same where assessed to the same owners, \$333,587; assessed value of town lots, \$232,230; improvements on the same where assessed to the same owner, \$800,040; improvements on all property assessed to others than the owners of land, \$67,206; total value of all personal property as assessed in 1875, \$2,572,047. Assessed value of telegraph lines, \$9,962; toll roads, \$37,850; railroads, \$358,360.

The following is the assessed value of the leading quartz mines of the county in 1875: Idaho mining company, \$310,000; Empire mining company, \$60,000; Eureka gold mining company, \$51,000; Providence gold and silver mining company, \$30,000; North Star gold mining company, \$25,000; Marietta mine, \$20,000; Nevada gold quartz mill and mining company, \$20,000; New York Hill mining company, \$20,000; California Consolidated mining company, \$15,000; Pittsburg mining company, \$10,000.

A Model Assay Office.

The destruction of the old assay office by fire and the steady increase of the monthly yield of the Consolidated Virginia mine, with the prospect in a very short time of the California doubling the amount of assaying to be done end the bullion to be handled, has caused Messrs. Mackay & Fair to erect an assay office and bullion reduction works commensurate in fitness and size with the immensity of their business, and which, without doubt, is superior to any private assay office on the globe. A peep at the inside and its appointments may not be uninteresting to our readers. The office is situated on the south side and immediately adjoining the hoisting works of the Consolidated Virginia. The building faces on F street, is 45 feet in width, 85 feet in length and two stories in height. The lower story is 12 feet in height, and contains the assaying and smelting departments. The upper story will be divided into offices for the superintendent of the mines and the chief secretary and his assistants. Running the whole length of the building on the front is a platform just the height of a wagon bed, greatly facilitating the loading and unloading of bullion. Built through the center on the ground floor, running the entire length of the building, and back again, is a double line, with a chamber two and a half by five feet in size, and a total length of 170 feet before reaching the south end of the building, where it ends in a huge brick smoke stack, 40 feet in height, on top of which is again placed an iron stack 50 feet in height. This fine is sheeted in the bottom with iron, and is built on the best improved plan for saving the silver which is constantly being carried off by the fumes and vapors while smelting. Extending across the building 30 feet from the north end is a hall 10 feet in width, which is to be furnished with a car and track for conveying the bullion to and from the assay and smelting rooms. The first room in the northeast corner is 12x15 feet in size, and will be used for the assay weigh room. Adjoining this on the south is the humid assay room, 12x15 feet also. In the center of the building, on the west of these, is the clerk's office and calculating room, 12x24 feet in size. West of these, in the northwest corner, is the laboratory and cupelling room, 18x24 feet in size, from which, crossing the hall, the visitor enters the ore assay weigh room, south of and adjoining which is the ore assay furnace room. The southwest corner room is occupied as a store room for supplies and a bath room furnished with

hot and cold water. The melting room has no ceiling, the two stories being open to the roof. It is situated in the southeast corner of the building, and is 22x50 ft in size. It contains eight furnaces, built on the best improved plans, with grate bars that can be removed or adjusted in a moment, when necessary. Its capacity is estimated at 2,500 pounds of bullion, avoirdupois, at a single melt. The draft of the furnaces is strong enough to instantly snuff out a candle. The office is furnished with two ore assay, one cupelling and two muffle furnaces. The ore assay and bullion departments are kept entirely separate in all their workings. On the first floor is a huge vault for the bullion, while on the upper floor is another vault for the valuable books and papers of the superintendent and secretary. The building is furnished throughout with glass doors, so that it is well lighted in the daytime, while at night it is furnished with gas jets in every room. The assaying and smelting capacity of the entire works is estimated at from \$5,000,000 to \$6,000,000 of bullion per month.—*Gold Hill News.*

Eureka's Bullion Product in 1875.

An item has been going the rounds of the press for some time, furnished by some one at Palisade, in which the total amount of bullion, base and refined, shipped from that point during the year 1875 is given. The item does not do credit to the different mining districts, being manifestly incorrect, as the shipments alone from Eureka district are greatly in excess of the round numbers thus furnished, which includes not only this, but White Pine, Tybo, Gila and other districts. Though we are unable at present to give the exact figures for the outside districts, through the courtesy of Samuel Cooper, agent of Wells, Fargo & Co., at this place, we now present the precise amount of bullion shipped and the value thereof, from January 1st, 1875 to January 1st, 1876—the product of the mines of Eureka district alone: Base bullion, 25,143,705 pounds, valued at \$1,233,730.14.

In addition to this, the value of refined bullion shipped during the same period amounts to \$1,026,328.06; all, with the exception of two or three bars, being from the Richmond. It will thus be seen that during the past year \$5,260,058.26 in bullion were shipped; a showing that speaks for itself as to the wealth of our mines. And yet this is only a beginning. The wealth of our district is but commencing to be developed. The immense discoveries made during the last year in our leading mines has instilled new vigor in the hearts of the claim holders, prospecting is being diligently prosecuted, and before our Centennial year has passed there will be a score of such mines as the Richmond, Eureka Consolidated and K. K. to swell the wealth of the now second district of the State, but destined soon to lead the van.—*Eureka Sentinel.*

The Carson Appeal is authority for the statement that the wages of trackmen and watchmen, of whom about 50 were formerly employed by the V. & T. R. R. company, have been reduced from \$3 to \$2.50 per day, and that in consequence about half of them have quit work. It further states that, under the new deal, all Chinamen formerly employed as section hands by the company will be discharged, and their places filled by white men. The reduced rate is still fifty cents per day above what is paid to section men of the Central Pacific. As near as we can learn, no reduction has been made in the wages of the men working on the railroad this side of the scales on American Flat, with the single exception of the night watchman at the Baltic switch.

Dr. J. S. LEFFINGWELL, writing from Florence, Arizona, to a friend in San Diego, says: I write you from the richest mining region I have ever seen or heard of. Samples of virgin silver were brought from the Pinal district today, which will assay twelve ounces to the pound; 1,000 pounds of this mineral will be here in a few days, and there are four or five tons in sight at the mine. I have some very fine claims in the vicinity of the Silver King mine, not so rich as the one mentioned, but they assay into hundreds. I will give you or any desirable person a half interest in any one of them, who will furnish capital to develop the same.

Mr. HALL, president of the Fryer-Noble melting mining company, says the Nevada Transcript, has now become a permanent resident of this coast, having disposed of his business in New York so as to allow him to devote his whole time to this new enterprise. He is very enthusiastic over the prospects of the State, and says California mines as an investment are at present attracting the attention of Eastern capitalists more than ever before.

An amateur Virginia scientist has finally solved the question as to how the Comstock lode was formed, and it is so simple that we wonder nobody thought of it before. Standing above the town, he remarks: "Mount Davis (Davidson) was there; then came a corruption—hence was caused a fissure and then the Comstock was deposited by congestion."

The snow is so deep in the Little Cottonwood mining district, Utah, that all travel and transportation of ore is impossible. Snow alides occur every few hours, sweeping down forests and wrecking cabins, and occasionally burying miners so deep in the debris that a search for their bodies would be useless.

The San Francisco Microscopical Society.

The annual meeting of the society was held on Thursday evening of last week, and aside from the reading of reports, election of officers and kindred business, but little done.

Messrs. S. B. Boswell and J. Z. Davis having complied with the by-laws, were transferred from the resident to the life roll. The President, Prof. Wm. Ashburner, made a very full and carefully compiled report of the doings of the society for the past year. The Treasurer, Mr. C. G. Ewing, presented a very favorable report of the financial condition of the society, and the librarian, Mr. J. P. Moore, handed in a complete inventory of the property, library, objects and materials in the hands of the organization.

The Nominating Committee reported the names of the old board for re-election, feeling that they were the right men in the right places, which seemed to be fully concurred in by the members, for upon balloting the following gentleman were unanimously elected to serve as officers and trustees for the ensuing year, viz.: Prof. Wm. Ashburner, President; Henry C. Hyde, Vice President; Col. C. Mason Kinne, Recording Secretary; Chas. W. Banks, Corresponding Secretary, and Chas. G. Ewing, Treasurer.

After the reading of the reports, Mr. Hyde offered the following, which was unanimously adopted.

Resolved, That the thanks of this society be tendered to our worthy President for his regular attendance at our meetings, and assiduous attention to the interests of the society, as well as for his interesting and very satisfactory report of our progress during the past year; to our two Secretaries and Librarian, for the careful and laborious performance of their respective duties, and, last, though by no means least, to our Treasurer, whose indefatigable efforts are in a great measure evidenced by his report this evening.

The thanks of the society were also tendered to Dr. Harkness for his interest in, and work he had done, for the benefit of the society, after which the meeting adjourned.

The Amador Canal.

The Amador canal and mining company have just discharged a gang of men that for a month past has been at work raising the bulk-head and the heavy stone abutments at the head of the canal.

During the heavy storm at the commencement of the present rainy season, the river overflowed the head gates, filling the canal with sand and debris, thereby causing no little damage and delay, and rendering necessary these improvements as a protection against future floods. Since the completion of the canal in October, 1874, this company have expended many thousands of dollars in improvements. Two miles and a half of flume, built by the old company, three feet wide, has been widened to six feet. The large dam at New York reservoir has been raised 16 feet, and the smaller one completed. The Buena Vista ditch has been purchased, enlarged, and put in running order. This branch is 22 miles long, and is used as a "second water" ditch. Its capacity is 600 inches every 24 hours. A pipe 15 inches in diameter and 3,500 feet long has been laid from the main canal to the divide, between Sutter and Amador creeks. This pipe passes under Sutter creek and sustains a pressure of over 350 feet. The original Amador ditch, nine miles long, has been enlarged and extended a mile to the Bunker Hill mill, on Rancheria creek. The St. Mary's hydraulic claim has been fitted up for working on an extensive scale. This claim uses 800 inches of water, and is run day and night. As a crowning act, at nearly the close of the last dry season, the Blue lakes were dammed, thereby securing for the canal a never failing supply of water during the dryest seasons. These extensive improvements have more than doubled the value of the company's property. Indeed, taking into consideration the magnitude of the works, the thorough and substantial manner of their construction, together with its extensive water privileges, the Amador canal and mining company can justly claim to own the most valuable water and ditch property in California.—*Amador Ledger.*

LOOK OUT FOR MOTHER EARTH.—And now there is more trouble ahead for our planet. Mr. Andrew Wilson, who has been writing pleasantly about the "Abode of the Snow" in Asia, revives an old theory of some ancient savant that the earth will topple over one of these days and send the oceans sweeping over the continents. It seems that the earth, that is, the portion of it which is not water, somewhat resembles a huge iceberg which, becoming topheavy by the destruction of its submerged parts, thereupon indulges in a summer-sank. So, Mr. Wilson thinks, that owing to the greater preponderance of water in the southern hemisphere, the greatest accumulation of water is around the South Pole; that when the accumulation has reached a certain point, the balance of the earth must be suddenly destroyed—the center of sphericity abruptly changed from the center of gravity, and the whole earth, almost instantaneously, will turn transversely on its axis, move the great oceans, and so produce one of those grand cataclysms which have before now altered the whole face of the globe.—*Ex.*

JOHN CONNELL, a miner in the Omaha mine, Grass Valley, lost both of his eyes by an explosion last week. He is a poor man with a large family, and his fellow laborers made him up a purse of \$700, to which Mr. Dodsworth, the superintendent, added \$50.

Will the Rothschilds Gain a Monopoly of Quicksilver?

A member of the Rothschild family has lately made a tour through the mining districts of California. The circumstance has aroused the California mind to the anticipation of great investments by the Rothschilds in the gold and silver mines of the State. Yet a slight acquaintance with the principles and history of the great banking house would demonstrate the unlikelihood of its embarking capital in an undertaking like gold and silver mining, where the product is fluctuating and precarious, the value of the commodities practically inflexible, and a control of the market quite impossible.

There is, however, an investment which might well tempt the Rothschilds in California, which is recommended by their traditions and experience, and which would assure them the monopoly of a staple indispensable to practical metallurgy.

The demand for quicksilver, which is incessant and presumptuous throughout the mining countries of the globe, is met mainly by two mines—New Almaden, in California, and Almaden in Spain. For some years previous to 1869 the annual yield of this metal was computed at seven millions of pounds. To this total the works at Idria, in Austria, Carniola, in Tuscany, Hungary, Transylvania and Peru contributed about half a million, while New Idria and other minor California deposits were credited with the same quantity. Six-sevenths of the whole, or the bulk of the world's product, evenly apportioned between the American and Spanish Almaden.

In practice, the former has usually fed the markets of Europe, Siberia and India, resigning to its youthful namesake those of China and Japan, as well as all the gold and silver bearing regions of this continent which skirt the North and South Pacific. The prompt and equitable adjustment of price to the shifting conditions of consumption and production, which has hitherto been guaranteed by the competition of two independent sources of supply, would be permanently imperiled by the concentration of their stores under the control of a single will. Now, it is a fact that the mine of cinnabar at Almaden, in Spain, has long been leased by the house of Rothschild.

There is reason to think that a monopoly of quicksilver might be made the instrument of a formidable advance in the price of the commodity without entailing that shrinkage in demand which is the normal corrective of such abuses. For the treatment of those chlorides and sulphurets which constitute the richest ores of argentiferous veins as well as for those rebellious pyrites with which gold is so often found mechanically combined, the familiar process of amalgamation is the simplest, most convenient and most effective. Indeed, the mill-men of California and Nevada, the practical metallurgists of Mexico and Peru neither know nor tolerate any other.

Moreover, in many American mining districts the margin for appreciation in the cost of reduction is very large. On the Comstock lode, at all events, the value per ton of the mineral developed by recent excavations is so considerable that no conceivable increase in the expenses of amalgamation would form an item of decisive moment. It is known, for instance, that in 1874, owing to a diminished production of the California mine, caused by obstructions of a geological character, and a corresponding falling off in its Spanish rival, occasioned by political disturbances, the price of quicksilver attained to \$1.60 per pound, or almost treble the figures at which it ruled five years before. A corporation, therefore, or a banking house, which should exclusively control this metal, might impose a tax on the bullion product of Nevada whose limit could only be determined by its own foresight and discretion.

We may surmise that among the rosiest speculations which have been suggested to the representative of the Rothschilds, the astute miners and mill owners have made no reference to cinnabar. But they who have marked the policy of that house, would be little surprised to hear that a purchase of the American Almaden had complemented their Spanish investment, and secured to them a conclusive monopoly in the quicksilver markets of the world.—*N. Y. Sun.*

HAND VS. HEAD LABOR.—At a recent distribution of prizes at Greenwich, Mr. Gladstone delivered an eloquent address, in the course of which he said that one of the first results of elementary education was to produce a desire on the part of young persons or their parents to escape from the necessities of manual labor, and pass into what is called head work. Here they had before them a very important subject. There was far too much eagerness on the part of the working classes to get out of the working class into another which was not a working class. The first thing a man ought to do was to elevate his vocation. A workman ought to strive to raise the character of the work he performed, and in doing that he was doing more to raise himself and his family and class than by hurrying out of his position. Hand labor was progressively and rapidly rising, whereas head labor was falling. The ex-Premier, in conclusion, urged that what the workingman should aim at was to raise the character of the labor which he was called upon to perform.

MANY of the houses in Virginia City are protected against avalanches by V-shaped structures, intended to divide and turn aside the descending snow.

Useful Information.

Edible Birds' Nests.

Edible birds' nests are found for the most part in the Southern Archipelago. The chief region of supply is that comprising Java, Borneo, Celebes and the Sula islands. The bird which produces the nest is a little swallow, *Hirundo esculenta*. This Salangan swallow, as it is called, is slightly bigger than a blue tit; it has a brown back; but the under surface of its body, as also the extremities of the feathers in its forked tail, are white. It flies with wonderful speed and precision; and on the Java coast, where the surge breaks wildly against the precipitous and caverned walls of rock, the little birds may be seen in swarms darting hither and thither through the spray. They probably feed on mollusks and other small animals which abound on those coasts. As you watch the surface of the water rising and falling, you notice how the holes in the rock are now concealed, now open again; and the little creatures watching their opportunity, dart in and out with lightning speed. Their nests are fixed to the arched roof of those caverns.

What sort of a thing then is the edible bird's nest, that ministers to the taste of the Inxarous Chinese. It is that portion of the fabric which serves as a sort of bracket on which the nest itself (made of grass, seaweed, fibers, small leaves, etc.) is built. There are two forms of this support, one flat like an oyster shell, the other deep and spoon-shaped. It is a transparent mass, somewhat like isinglass, mother-of-pearl or white horn, and is of animal origin. It was formerly supposed that this gelatin-like mass might be prepared in the bird's crop, from seaweed and other marine plants. This, however, is a mistake. If one opens the animal's stomach about the time of building, it is found to contain insects, but no vegetable matter; moreover, in all species of the family of swifts, the crop is waiting. Dr. Bernstein has found that at that season the salivary glands under the tongue are enormously developed. On opening the bill they are seen as two large swellings, one on either side, and these chiefly supply the material in question. They secrete a viscid mucous substance, like a concentrated solution of gum arabic, which can be drawn out of the mouth in long threads, and in the air it soon dries, and is found to be the same (even microscopically) as the bracket material.

When one of the little birds wishes to begin building, it flies repeatedly against the selected spot, pressing each time a little saliva against the rock with the tip of its tongue. This it will do from ten to twenty times, moving away not more than a few yards in the intervals. It then alights, and arranges the material in semi-circular or horse-shoe form on the rock, continuing to add saliva to that already deposited, and by the motions of its body from side to side the yet soft saliva is forced out over the harder parts, producing those peculiar undulatory bands which give the nest a stratified appearance. It is thought not unlikely that part of the secretion used by the bird comes from the largely developed glands in its stomach; also, that gelatinous matters picked up in the surge are employed in the construction of its nest. The Salangan never uses the same nest more than once, and that for only a month; and after the young brood is flown the nest soon decays and falls to pieces.—*Chambers' Journal*.

EXTRACTING OIL FROM ROSES.—The process of extracting oil from roses, which is known as the costly and delightful perfume attar of roses, is very simple. It is carried on extensively near Adrianople and the Kezanlik valley, in Roumelia. Three pounds of the flowers produce but one pound of attar. The appliances are a copper kettle ending in a narrow neck, to which a condensing tube is affixed, and containing about 250 pounds of water to 25 pounds of rose leaves. The first distillation produces rose water; this distilled a second time yields an essence on which the pure oil floats. This is skimmed off in minute quantities and preserved in tight bottles for sale. An average production is 1,500 pounds in one season. The flowers are picked from April to June. Very little pure attar is to be procured, the dealers in this article, as in some others, pretending to believing the pleasing fiction that consumers would rather have the adulterated one.

THE BLUEISH GREEN BRONZES used for ornamental articles are very easily imitated. Almost any metal is first covered with a varnish made of ground tin or bronze powder rubbed up with honey in gum water. Then wash with a mixture composed of sal ammoniac half ounce, common salt, half ounce, and one ounce of spirit of hartshorn in one pint of vinegar. After applying the mixture, leave for a day or two in the sun, and then, if necessary, add a second coat. This is a good way to renovate old gas fixtures.

A MONSTER BOILER.—The largest soap boiler in the world, probably, may be seen at Babbitt's soap works, corner of West and Washington streets, New York. It is made of wrought iron, and will hold 1,200,000 pounds of soap. It was built in 1872, and is constructed of wrought iron. It extends from the ground floor of the building up through five stories, and is quite a curiosity in its line.

AGE AND OBJECT OF THE PYRAMIDS.—M. A. Dufew, member of the Egyptian Institute and of the "Society of Historic Studies of Paris," claims to have made some very valuable discoveries relative to the age and object of the four pyramids of Gizah, principally of the great pyramid, containing chronologic and scientific data for establishing the date of their construction, for determining the era of the monarchy of the Pharaohs, and the degree of knowledge displayed by the ancient Egyptians in astronomy, geodesy, hydraulics, geography, geology, and in regulating the inundations of the Nile for the benefit of their agriculture. He has written a book about it, in which he claims that the methods by which he has been led to his discoveries are entirely new. According to his view Menes ascended the throne of Egypt 5,641 years before Christ; the great pyramid was founded 4,862 years before Christ; all the pyramids were designed simply as monuments of high science, and were the work of priests of the idolatrous religion of the Pharaohs. The mystery of these awful monuments of the past has been penetrated and reported upon so often and so differently, by different students of the subject, that one cannot help feeling as though fancy has as much to do with the interpretation of the pyramids as science or judgment. M. Dufew is sharply criticised by some of his own countrymen, probably with justice.

ROMAN IRON FURNACES.—It is rather remarkable that Roman iron slags are always found on the tops of hills, and never in a valley, where water power could have been utilized to effect a draft. Hence it is inferred that the Romans never used bellows, but that they employed the natural draft of the wind in some manner. The indications are that hollows or shafts were dug out in the hill top, to which a long tunnel was driven from the side of the hill against which the prevailing wind blew. Through this open passage-way to the bottom of the furnace there would be a strong draft, which could be utilized for blower purposes. It is evident such a process must have been very inefficient, and attended with great loss of iron, which must have been left in the slag. Similar furnaces were used in Derbyshire, England, as late as the 17th century, probably handed down from the Romans.

HOW TO OIL A MILL SPINDLE.—Professor Norvel Hoge, of Greene county, Pa., suggests the following method of oiling a mill spindle, which may be of value to some of our readers. He says: "Bore a hole of suitable size diagonally through the follower, (if made of wood,) from the outside bottom corner to the inside top corner, into which insert a piece of lead or tin tube, fitting neatly, trim the upper end to fit the spindle, then prepare another similar tube that will fit nicely inside the first, provide a piston to fit the inner tube, inserting the piston into the lower end of this inner tube, fill it with oil, after which introduce it into the tube in a bush follower from the under side. To oil the spindle as occasion may require, press the piston upwards, and when the oil is exhausted, take out and refill the inner tube."

Iron is the symbol of civilization; gold represents wealth. The value of the former in the arts can be measured only by the progress of the present age. In its adaptations and employments, it has kept pace with scientific discoveries and improvements. Hence the use of iron indicates the advancement of nations. Iron is worth more to the world than all other metals combined. We could dispense with gold—it ministers largely to luxury and refinement—but iron represents the honest industry of labor. Its use is universal. There is no "California" of iron; it is found in great abundance in every nation on the earth. From this fact we discover how indispensable the Creator deemed this metal to the education and development of man.—*Ex.*

GOOD HEALTH.

Typhoid or Remittent Fever.

Messrs. Editors:—There has been a good deal of sickness in our county during the last six months. In different localities different causes have been assigned; by some the drouth of the past season has been made the scapegoat.

Among children a fever which has been misnamed "typhoid," and for which "remittent" would be a more proper designation, has caused some mortality. As cases are still occurring, I thought I would mention in your columns my own experience, which may be of use to some anxious mother, distant from able medical advice.

In the fever which attacked my own three little ones there were two or three febrile paroxysms and remissions during the 24 hours. The paroxysm at midnight was usually the worst, head hot and throbbing, body quivering and shuddering, and starting. Perhaps some slight disturbance of the brain, but not enough to constitute "typhoid" fever; drowsiness, but not sound sleep; disinclination for food, but considerable thirst. When the paroxysm had passed the body returned to nearly its normal temperature.

The treatment which acted "like a charm" on my little ones was the administering of 20

grains of cream of tartar, dissolved in a tablespoonful of boiling water, to which a little sugar was added to make it more palatable. For a drink "Imperial" was used; it is made as follows: scald a jug, put in a quarter ounce of cream of tartar, and pour thereon one quart of boiling water, adding a little lemon peel, or essence of lemon, and sugar to make it nice. The child may drink freely of this, but must be almost starved as regards solid food, until the fever has almost or quite gone.

It is most distressing to see a child's flesh waste away; one's heart aches to give it food, but while the fever is raging, giving food is merely feeding the flames, and usually the child's stomach revolts from any food proffered.

Keep the patient warmly clothed and out of "drafts" of air. If the child is "teething," lancing the gums will probably be beneficial.

Cream of tartar is both diuretic and purgative, and if the first dose produces a sufficient result, in each way, before the expiration of 24 hours, it need not be repeated; if it has not been efficacious a second dose may be tried. Take care that the medicine has not lost its virtue from long keeping.

Possibly so well known and common a drug may be discredited under its usual homely name. If so, you can call at the drug store for bi-tartrate of potash, or according to the new chemical, nomenclature, "potassic bi-tartrate" and use that as you would our old familiar friend, "cream of tartar."

It is astonishing, Messrs. Editors, how potent a few "long tailed" words are sometimes. I once heard of an old lady, who had been sitting under some pet preacher, relating her experience of his discourse, as follows: "Ah! my dear, it was a wonderful sermon; he used that blessed word 'Mesopotamia' three times." Similarly some sick folks appear to think that a prescription a yard long is more likely to suit their disease than a simple remedy.

A physician in a neighboring town, who is notable for his common sense treatment of diseases and his low charges, once told me that he had been looking over the files of old prescriptions in a drug store, and had found combinations of six or seven different drugs in one mixture. What the prescriber expected to be the action, or re-action, or mal-action, of those drugs in the miserable patient's stomach, was beyond the flight of my friend's imagination to picture.

I think I must write you a paper on "Physic for Farmers." One of your late editors asked me once to write an account of the epizootic and its treatment. I had had no experience in the disease then; but I presume the epidemics to which children are liable are equally worthy of attention in your columns.

Carmel Valley, Monterey. E. W. BERWICK.

The Walking Cure.

He has passed Atlanta, Ga., and gone to Topeka, Kansas.—De Mahler—a man who has traveled around the world and all over it on foot. He walks for pleasure. Sometimes a wagoner on the road accosts him with "Stranger, want a lift?" He always replies, "No; rather walk," and some miles on passes the home of the wagoner, who by this time has his wife and children out to look at the man who had rather walk than ride. De Mahler goes trudging on, like the wandering Jew. He has put 40,000 miles behind him since 1862, and has acquired such a momentum now that he can't stop. He must walk to be happy. Of course he stops sometimes for rest and refreshment and sleep, but 'tis only a halt. An Atlanta editor took De Mahler to his house and got some particulars of his walks in life out of him.

De Mahler is a Virginian. He has estates that yield him such an income as enables him to go where he pleases and enjoy himself in his own way. He was wounded in the beginning of our war, and when his wounds healed he was bent nearly double and was totally unable to walk. He was rolled up almost like that being which turns itself into a ball and wheels from place to place. He went to Paris to get straightened out. The surgeons operated upon him; but, after a fair trial, they couldn't make his head and feet stay at their respective ends of the man. At length they told him that nothing could effectually cure him but walking. He resolved to try it. He told his doctor that he was going to walk out of Paris and leave France on foot. His doctor told him he was crazy. He, however, commenced the journey, and made only 104 yards from his lodgings the first day, with the aid of a stick. The doctor tended him two weeks on his trip, that is, until he got out of Paris. He had then begun to improve, and was filled with a glorious hope. He put his whole soul into his walk. In a month he was on the sunny slopes of the Pyrenees and had begun to straighten up like a man. He walked on, and on, and on. At length he was entirely cured and strode with a firm tread. Thus he walked along the world and across it, and became intensely interested in his travels. He sailed across the seas, but walked the decks of vessels in order to keep his foot in. On land he seems to walk as naturally as the winds blow and the streams flow, and now he can't stop. He makes pencil sketches of the best scenes and remembers every place he has been in and the name of somebody he met and talked to. He is thoroughly cured of his war wounds, but many lazy people might think that the cure is worse than the original affliction.

Domestic Economy.

Useful Recipes.

Yeast that will Keep Two Months.

Parse three or four medium sized potatoes and boil till perfectly soft; boil a handful of hops in a separate dish. Mash the potatoes, strain the hop water, and put in with a large tablespoonful of salt, and two tablespoonfuls of sugar. When nearly cold add half a cup of home-made yeast or two tablespoonfuls of brewers' yeast. Put in bottles or a stone jar, and set in a cool place. Half a cup will raise a large loaf.

Graham Pancakes.

One pint of sour milk, one teaspoonful of soda, one teaspoonful of salt; thicken with Graham flour. Let the batter stand 20 or 30 minutes before baking.

Another very good way is to mix a batter at night, with warm water and yeast, the same as for buckwheat, and in the morning it will be light and ready to bake.

Pumpkin or Squash Pudding.

Prepare the same as for pies, and bake in a pudding dish without crust. A good recipe is the following: One cup of stewed pumpkins or squash, one quart of milk, three eggs, a little salt, sugar to sweeten to taste; flavor with ginger, nutmeg or cinnamon; put in a pudding dish, and bake about an hour in a hot oven.

Rice Pudding.

One cup of boiled rice, three pints of sweet milk, three eggs, one cup of sugar; flavor with nutmeg or lemon, and bake from half an hour to an hour.

Indian Meal Pudding.

Scald three pints of sweet milk, and thicken with two-thirds of a cup of corn meal; when nearly cold add three eggs, two-thirds cup of molasses or sugar, one teaspoonful of salt; flavor to taste; if wished, add a piece of butter the size of a hickory nut. Bake slowly from an hour and a half to two hours. Serve hot, with or without sauce.

Sponge Cake.

Three eggs beaten very light, one and a half cups of sugar, two cups of flour, one half cup of cold water, half teaspoon of soda, one teaspoon of cream tartar, half teaspoon of salt; flavor with lemon.

Ginger Cake Without Eggs.

One-half cup of sour milk, half cup of sour cream, one small teaspoon of soda, one good teaspoon of salt, two-thirds cup of molasses, one good teaspoon of ginger; or, take one cup of sour milk, and instead of cream a piece of butter the size of an egg.

Choice of Milk.

Cow's milk differs greatly in quality, some being rich and other thin and watery. In choosing a family cow it is well to bear this in mind, and to select only those that are healthy and give the very best milk. They should also be fed on the best of food, and allowed pure soft water to drink. The practice of feeding cows on garbage, swill slops, distillery feed, and keeping them confined in close, filthy, unventilated stables, is one which seriously deteriorates the milk, and should ever be avoided.

Those who live in cities cannot of course keep cows, so they must depend on the market for their supply of milk. In such cases insist on having the best article, and refuse to use that from distillery-fed cows, or that diluted with water. A little attention to this subject will enable any one to secure a good article. It is the laxity of purchasers of food in not demanding the best that makes it so easy for the dealer to palm off adulterated and inferior articles upon thoughtless people. If the poor would do this, it would improve their own and their children's health wonderfully. The milk supply of a city has a great deal of influence for good or evil on the health of the children. In England this question is getting to be a very important one. The *Food Journal* says that "perhaps the most serious and destructive change in the nutrition of the poor is their almost total privation of milk. Infantile sickness and mortality depend largely on this want." There the occupation of mothers in factories and workshops deprives many thousands of infants of their natural food—breast milk.

ORANGE CAKE.—One cup of powdered sugar, half cup of butter, three eggs, two cups of flour, half cup of sweet milk, half teaspoonful of soda, one teaspoonful cream of tartar. Rub the sugar and butter together to a cream, beat the yolks and whites of the eggs separately. Bake in jelly tins. Squeeze the juice and grate the rind of one orange, and powdered sugar enough to make it stiff enough so that you can spread it between the layers of cake; also add the white of one egg beaten to a stiff froth. This will generally make enough to spread between the four layers of cake and over the top.

SPONGE CAKE.—Six eggs; the weight of six eggs in sugar, and the weight of four in flour, with a lemon extract, or a little grated lemon peel; a little salt, and a spoonful of baking powder.

RYE BREAD is made like wheat, with one exception—the loaves are made quite soft. As little flour as possible is used in molding.

MINING SCIENTIFIC PRESS

W. B. EWER, SENIOR EDITOR.

DEWEY & CO., Publishers.

A. T. DEWEY, GEO. H. STRONG
W. B. EWER, JNO. L. BOONEOffice, No. 224 Sansome St., S. E. Corner
of California St., San Francisco.

Subscription and Advertising Rates:
 Advertising Rates.—1 week, 1 month, 3 months, 1 year.
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 One-half inch.....\$1.00 3.00 7.50 24.00
 One inch.....1.50 4.00 12.00 40.00

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San Francisco:

Saturday Morning, Feb 12, 1876.

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Establishment of a Clearing House.

After considerable delay in the consideration
 of details, a clearing house has finally been
 established in this city. How a great money
 center like San Francisco has so long trans-
 acted business without this labor saving insti-
 tution is to be wondered at. Clearing houses
 have now come to be an acknowledged neces-
 sity in large cities, and prove a great conveni-
 ence to bankers, brokers and merchants. The
 custom of employing clerks, like so many pack
 mules, to transport specie from one bank to
 another, under the operation of the
 clearing house, he done away with. Hereafter
 the adjustment of daily balances between the
 different banks will be accomplished simply by
 the transfer of checks.

The following officers of the clearing house
 have been elected: President, Milton S.
 Latham, of the London and San Francisco
 bank; Secretary, Ignatz Steinbart, of the Anglo-
 Californian; Clearing House Committee—D.
 O. Mills, of the Bank of California, F. Low,
 of the Anglo Californian, A. McKinley, of the
 Bank of British North America and Homer
 King, of Wells, Fargo & Co.

SEVENTY corpses have so far been recovered
 from the Jabin colliery, Belgium. The earth is
 constantly falling in, and the search proceeds
 slowly, under circumstances of great danger.

The Quicksilver Furnace Litigation.

A suit was instituted in the United States
 Circuit Court about 18 months ago by R. F.
 Knox and Joseph Osborn against the Great
 Western quicksilver mining company, for in-
 fringement of certain patents issued to them
 for improvements in roasting furnaces for the
 reduction of cinnabar.

The Great Western quicksilver mining com-
 pany built their first furnace in the winter of
 1873-4 and commenced reducing cinnabar in
 the spring of 1874. This furnace was claimed
 to be an infringement of their patents by the
 plaintiffs, but not admitted by the defendants.
 Issue was joined and the trial began in this
 city on the 21st of January last, to determine
 the points in dispute.

In their case the plaintiffs put in evidence
 their patents, proved the great utility of their
 inventions, showing a great reduction in cost
 of reducing the ores of mercury by the con-
 tinuous working furnace, and the more effectual
 saving of the mercury over any furnace used
 before the advent of the Knox & Osborn
 furnace.

The defence set up was, that the patents were
 wrongfully issued to the plaintiffs, being a
 combination of old devices, not patentable; and
 further, if the patents were held good, they
 (the defendants) had not infringed them.

This being the first attempt to sustain these
 patents, and there being some 15 to 20 furnaces
 built which are claimed as infringements, the
 case created great interest, and was to some
 extent a combination of all the interested
 parties in the State to break the patent, and
 thus end the possibility of claims against other
 companies being made in the future. In the
 course of the trial, every furnace which was
 ever heard of which was thought to contain
 any one of the devices of the Knox & Osborn
 furnace was brought forward and discussed by
 the experts, who gave learned opinions of all
 the old furnaces and line kilns ever sketched
 in books or even heard of yet nothing was
 produced showing a continuous working quick-
 silver furnace until the Knox & Osborn fur-
 nace was built.

It also appeared in evidence that since this
 furnace has been in operation no intermittent
 furnace of the old style has been built, showing
 a great revolution in the manner of reducing
 mercurial ores, by which lower grade ores are
 now profitably worked, and many mines now
 paying expenses while being opened, which
 could not be worked with the old style of fur-
 nace.

After an elaborate charge by Judge Sawyer,
 the case was submitted to the jury on Monday
 last, who after a short deliberation rendered a
 verdict sustaining every claim submitted to
 them in the plaintiff's patents, and also found
 all the claims infringed as charged.

This may be regarded as a test case, having
 been very thoroughly and vigorously contested
 on both sides, and although there may be
 other suits embracing the same points of law
 as this, it is probable that the result in this
 one will be held as conclusive.

Lunar Researches.

An interesting lecture was delivered in the
 School of Mechanic Arts course on Saturday
 evening last, by Professor Frank Soule, on the
 subject of "Recent Researches on the Lunar
 Surface." After referring to the marvelous and
 often fantastic theories and superstitions of the
 ancients concerning the moon he passed to the
 time of Galileo, when the wonderful genius of
 that astronomer invented the telescope, and
 opened a new field of investigation to mankind.
 With his rude instrument of only 30 diameters
 of magnifying power, Galileo could perceive
 but the bolder and more general features of the
 disc, while we will employ ere long a telescope
 which the scientific progress of three centuries
 has perfected, with a power of several thousand
 diameters.

In using the immense telescopes of modern
 times, one is surprised at the exceedingly small
 area that can be examined at one time, and by
 the great diminution of light which appears to
 take place. A careful survey of the surface
 fills one with astonishment that, "the placid,
 silvery moon" should be changed into a ragged,
 gray, wrinkled, and pockmarked heavenly
 beauty.

On turning to the brighter portions we find
 everywhere mountains, volcanoes, crevasses
 and precipices of vast height or depth. It
 seems to be a picture of desolation, enthroned
 upon a pedestal of ashes. Those mountainous
 parts reflect a brilliant light on account of their
 volcanic nature, the rocks being often smooth
 and polished, and their jagged surfaces giving
 them power to catch and throw light in every
 direction. The southwestern portion is espe-
 cially volcanic in its appearance. On close
 examination, however, we find long ranges of
 mountains exhibiting no signs of volcanic
 action, but in many respects similar to the
 Sierras, much steeper on one side than the
 other, and apparently formed by similar forces,
 though as a rule the volcanic element prevails.
 Many of these mountains are of immense size;
 thus Clavius is 120 miles in diameter, has an
 area of 12,000 square miles, and turrets on its
 walls shooting to an altitude of 16,000 feet.

We next notice the frequent occurrence of
 ringed mountains, not more than 10 to 15 miles
 in diameter, and almost perfectly circular in
 form. They are found alone upon the level
 country, or in groups, and even upon the
 ridges of the walled plain. There are also
 craters and pits, which differ chiefly from the
 others in their smaller dimensions. There is
 also another prominent feature which has puzzled
 astronomers, even to the present day. From
 many of the ringed mountains, notably
 from Tycho, Copernicus and Kepler, are radia-
 tions, extending in some cases hundreds of
 miles, which at the full of the moon glisten
 with a remarkable brightness. They shine as
 brilliantly under the oblique as under the ver-
 tical rays of the sun—a fact yet unexplained;
 they pass over the tops and through the craters
 of volcanoes, and down through the valleys in
 an uninterrupted course. Of the many theories
 concerning them, perhaps the most reasonable
 is that they are veins of matter ejected from
 below during some great volcanic or earthquake
 disturbances, and in many respects they re-
 semble our own trap dykes and seams.

Since the time of Galileo, astronomers have
 painfully, patiently and perseveringly mapped
 every detail of the moon's surface, until we
 have lunar topographical charts more accurately
 constructed than any hitherto constructed of
 the earth's entire surface. Photography has
 recently aided largely in this work.

By careful experiments it has been proven
 that the light of the full moon is only 1 600,000
 part of that of the sun, and that she gives only
 one-sixth as much light as would a pure white
 disc; therefore, she is nearer black than white.
 An equal sized globe of fire-brick or clay thrown
 into the orbit of the moon would furnish us
 with light as bright as our own luminary.

As early as 1700 efforts were made to ascer-
 tain if any heat came from the moon, her rays
 being concentrated by means of a lens upon the
 bulb of a thermometer, with no effect, however,
 and other and later trials with improved appa-
 ratus gave the same result, or in some cases
 indicated that the moon was shedding negative
 heat, or cold. It was only after the invention
 of the thermopile that evidences of lunar heat
 were discovered. The amount was excessively
 small, however. Lord Rosse with the aid of
 his three-foot reflecting telescope and Thomp-
 son's galvanometer, shows little, if any, of this
 heat comes from the interior of the moon; or,
 in other words, that the body of that luminary
 would be cold but from the heat absorbed from
 the sun. This borrowed heat has been shown
 to raise the exterior temperature of our satel-
 lite to at least 50 deg. Fahrenheit. As the sun's
 heat and light cease to fall upon her surface
 and are lost for 15 days at a time, and the
 remaining heat being radiated into space, the
 alterations of temperature must be something
 startling, and the changes in the physical
 features of the body produced by the enormous
 expansions and contractions of her outer sub-
 stance must be great and very destructive.

Professor Soule will deliver another lecture
 upon different phases of this subject some time
 in March next.

THE FRYER PROCESS ON PEAVINE ORE.—We
 have been shown, says the Gold Hill News, the
 results of the working of 18 pounds of ore from
 the Golden Fleece mine in Peavine District, by
 the Fryer process, in Grass Valley, California.
 This ore, although rich and giving excellent
 assays, has always heretofore defeated every
 effort made for its successful reduction. Its
 combination of materials is one of the most
 stubborn on the coast to overcome. It seems,
 however, to make no difference with the Fryer
 process, the ore working with the same ease
 and successful results as the free ores of the
 Comstock.

The result gave a return of \$54.98 per ton in
 gold and silver, there being only \$2.48 gold.
 The value of the bullion was \$1.23 per ounce
 —\$1.17 58-100 in silver, and .06 20-100 gold,
 there being no base metal whatever in it, prov-
 ing as conclusively as it is possible that the
 process makes a clean sweep of all the base
 metal. Not satisfied with the statement, Mr.
 Henry had the bullion assayed and tested in
 the most thorough manner possible by Mr.
 Gilbert McM. Ross, of this town, every test
 failing completely to find any base metal what-
 ever.

This is certainly good news for the stock-
 holders of the Golden Fleece, who rejoice that
 they have at last found a process by which
 their ores can be treated successfully. They
 have a large ledge and almost inexhaustible
 bodies of the ore, easy to get at and extract;
 and all they now await is the test of the ore in
 large quantities and the erection of proper
 character of reduction works to add another to
 the many rich mines of Nevada.

EGYPT AND JAPAN.—It is a fact worthy of
 record that the very first to arrive on the ground
 of the foreign contributions to the Centennial
 was that of Egypt, the oldest of known nations
 making her friendly offering to the youngest.
 Speedily upon this came the practical demon-
 stration of the friendly spirit of Japan—19 cars
 loaded with her exhibits having reached the
 Centennial grounds on the 17th of December.
 The North American thinks there is a better
 illustration of the importance of the exposi-
 tion to be gleaned from these two items than
 from a volume of argument.

The postal telegraph bill has made its re-
 appearance in Congress, having been intro-
 duced in the House by Representative Luttrell.

The Berry Debris Bill.

On another page of the Press we print an
 article from the Oroville Mercury concerning
 the bill introduced in the Assembly by Mr.
 Berry, of Sutter county, for the appointment
 of a commission to investigate the mining de-
 bris question. Below will be found the full
 text of the bill:

WHEREAS, The detritus washed from the hy-
 draulic mining claims is filling our river chan-
 nels, destroying navigation, and irreparably in-
 juring large portions of our valley lands; and
 whereas, this deposition of detritus is rapidly
 increasing, threatening greater damage in the
 future, even menacing the existence of some of
 our cities, towns and villages; and whereas,
 the great interest involved being the two chief
 industries of our State, the agricultural and
 mining, neither of which can be injured with-
 out inflicting injury upon the other and upon
 the State; and in order to enable a future Leg-
 islature to act intelligently, and by wise legisla-
 tion secure a just solution of the subject, and
 thus avert the danger impending; therefore the
 people of the State of California, represented
 in Senate and Assembly, do enact as follows:

SECTION 1. Within ninety days after the pas-
 sage of this Act, it shall be the duty of the
 Governor of this State to appoint three Com-
 missioners, one of whom shall be a practical
 mining engineer, one a competent engineer
 from the agricultural district, and one a com-
 petent civil engineer.

SEC. 2. It shall be the duty of the Commis-
 sioners appointed in accordance with Section 1
 of this act, at such times as they may choose,
 to visit the principal hydraulic mines upon the
 headwaters of the Sacramento river, Feather
 river, the Yuba river, the Bear river, the Ameri-
 can river, and such other streams as they may
 deem necessary, for the purpose of ascertaining
 the amount of detritus annually discharged, by
 process of hydraulic mining, into the streams,
 water-courses, and bays of this State. They
 shall also collect information as to whether
 this class of mining is on the increase or de-
 cline.

SEC. 3. It shall be the duty of the Commis-
 sioners to collect all information attainable by
 them as to the amount of gold produced from
 the hydraulic mines, the cost of extracting the
 same and such other information thereto as
 they shall deem proper to lay before a legisla-
 tive body.

SEC. 4. It shall be the duty of the Commis-
 sioners to visit the Sacramento, the Feather,
 the Yuba, the Bear, and the American rivers,
 and such other streams, water-courses, or bays
 as they may deem necessary, at different
 points, for the purpose of ascertaining, as near
 as practicable, the height (?) depth to which
 the streams visited by them have been filled,
 the amount of damage done to the lands along
 and adjacent to the streams, by the deposit of
 detritus from the mines.

SEC. 5. It shall be the duty of the Commis-
 sioners to make approximate estimates of the
 capacity of the streams for retaining the debris
 discharged into them, the proportion that
 passes into tide-water, and such other approxi-
 mate estimates relative thereto as they shall
 deem proper to embody in their report.

SEC. 6. It shall be the duty of the Commis-
 sioners to suggest a plan or plans whereby the
 detritus from the mines may be prevented from
 finding its way into the rivers and bays, and
 for this purpose they shall have the power to
 make surveys, take levels, and submit estimates
 of the probable cost of executing the plan or
 plans submitted by them. They shall also
 collect all other information relative to the
 duties prescribed by this act as may, in their
 judgment, guide or aid a legislative body in
 framing [a] law for the abatement of the evils
 set forth in the preamble to this act.

SEC. 7. It shall be the duty of the Commis-
 sioners to compile all the information collected
 —all estimates, surveys, plans and suggestions
 —in a brief and concise form, and report the
 same to the Governor, on or before the 1st day
 of December, A. D. 1877.

SEC. 8. The Governor shall cause the same
 to be laid before the Legislature, whenever he
 shall be notified of its organization.

SEC. 9. Each of the Commissioners appointed
 under and by virtue of this act, shall receive
 the sum of — dollars for all services herein
 required.

SEC. 10. When the Governor shall receive
 the report of the Commissioners, herein pro-
 vided for, he shall certify that fact to the Con-
 troller, whereupon the Controller shall draw
 his warrant upon the State Treasurer for the
 same; and the Treasurer shall pay the warrant
 thus drawn out of any moneys in the Treasury
 not otherwise appropriated.

SEC. 11. This act shall take effect and be in
 force from after its passage.

STOCK BOARD FOR EASTERN OREGON.—Owing
 to the fact that the capitalists of Portland are
 about to establish a mining stock board to han-
 dle Eastern Oregon mining stock, the Baker
 City Democrat urges the mine owners of East-
 ern Oregon to incorporate a stock board in that
 city, not merely for the purpose of stock trans-
 actions, but with a view of gathering authentic
 information in relation to the mines and to be
 able to make interested parties acquainted with
 the mineral resources of that section. It is a
 good suggestion, and might be acted upon to ad-
 vantage.

A Report on the Coso Mining Region.

We give herewith a report on the property of the Coso Consolidated mining company, Inyo county, made by Mr. J. S. Phillips, M. E., (author of the "Explorers", "Miners" and "Metallurgists' Companion.") The report will be of interest to those interested in the Coso mineral region, as it gives an account of the general characteristics of that new district, as well as the details concerning the mine reported on:

Geographical Position.

The Coso Consolidated mines are located in the county of Inyo, California, about two miles north from the town of Darwin, about one day's travel by stage from Caliente railway station, and two days from San Francisco by rail and stage.

Geological and Mineralogical Features.

This property and most of the other mines of the district are located in Coso mountain, which is chiefly composed of the highly tilted stratification of the older clay, slates, limestones and magnesian limestones, interlaced by dikes of feldspathic rocks and metamorphosed by the close proximity of subterranean heat, as shown by a surface outcropping of lava in its vicinity, at just half a mile below. This Coso range is evidently a continuation of the Inyo, which also trends southerly, and is similarly composed both in its rocks and metallic mineral combinations.

The Coso veins also closely resemble those at Cerro Gordo, in the Inyo range, and do not always conform to the divisions of cleavage in the strata, but have generally taken independent diagonal fracture, somewhat after the order and comports of true fissure veins.

The minerals are also similarly composed, being mostly silver-bearing sulphuret and carbonate of lead, with congenerial ferruginous stains, very generally disseminated therein.

General Character and Quality of Veins.

There are two strong veins already discovered—the Raleigh and Bella Union. The Raleigh lies about 1,000 yards southeast of the Bella Union, and somewhat higher in the hill. It bears 38 deg. east of north, dips 80 deg. westward and has been worked to some slight extent by a shaft on the vein. So far as seen, it appears to be about three feet wide and contains interesting ferruginous stains throughout, with occasional stains of the sulphuret and carbonate of lead. It deserves further proof by tunnel on the course of the vein, which I think can be easily traced to much lower ground at a slight distance northward.

The Bella Union vein has been much more extensively explored by a shaft, 110 feet deep, two levels and a winze communicating from level to level. This vein has an average bearing of about 30 deg. east of north, is not generally less than 6 feet wide, and dips 55 deg. westerly. The surface cropping of the vein exposes mineral just in one place only, some 50 feet southward from the shaft, and in sinking the shaft comparatively little of value was discovered, but in driving the bottom level an abundantly mineralized vein was gradually discovered at 30 feet northward, where it became and continued really valuable for at least 130 feet beyond this point, when it, however, temporarily fell off in value for a few feet, but not in size or strength, for, although the lode did not contain the mineral, it looked as well defined and even more interesting in the north end, or drift, than at any other place, having distinct laminations parallel to the smooth and well marked corrugated slickenside walls, which has accompanied the vein backward, and still retained the heavy and congenerial ferruginous stains throughout.

I am informed that since my return, even greater value of lead minerals have been again attained in this drift.

Quantity and Value of the Ore at the Surface and in the Mine.

The amount of ore now lying at the surface, on the 1st of December, 1875, equalled at least 800 tons, which I estimated would realize about 260 tons of argentiferous lead bullion. As to its value, I may say that 15 assays from selected stones, made for both lead and silver, afforded an average of 54 per cent. lead and \$109 per ton silver, which would have smelted, allowing for practical loss of lead, at about the rate of two tons of mineral and \$218 of silver for each ton of bullion produced.

It is, however, difficult to estimate from mere assays, without the actual large scale smelting examples, the correct value of the resultant bullion smelted from such mixed varieties of lead and silver ores, but I think it may be safely placed at from \$180 to \$200 of silver per ton of lead bullion. The lower one of these, the \$180 of silver per ton of lead bullion, can be sold at San Francisco for both lead and silver at about \$220 per ton.

The cost of the mining and smelting of this and future ores into such bullion, and delivering it at San Francisco, need not exceed \$105 per ton of bullion produced, and therefore the present surface ore piles already broken should realize the total profit of \$27,300.

This ore was all excavated in simply driving the bottom level of six feet in height through the 130 feet of mineral before stated, and in sinking the winze 54 feet deep by six wide from the upper level through the same deposit of ore to the lower level, which exposes and

equals a superficial sectional area on the vein of only 1,104 feet.

Now, by taking the above as a safe average value of that portion of the vein already thus promptly obtained, and estimating what has been laid open by allowing only (according to the practice of the most careful miners) 30 feet above and 30 feet beneath this level, you will be much pleased to know that you have 7,800 superficial feet remaining in section (130 feet by 60 feet), and the consequent profit value, over all expenses, of \$192,880.00, which makes the total profit value already in sight, above and below the surface, \$220,180.00, regardless of the lode showing continuous value, still being developed by the north drift and the deeper future levels on the splendid abutment of mineral just alluded to in these valuations.

Suggestions for Development of the Mine.

As you have already practically laid open and hoisted to the surface sufficient ore for running one furnace 12 months, it will be well to continue driving the north level through the ore in that direction so as to prove how far it continues, and if it should continue far it will be most advisable to sink a vertical hoisting shaft through the soft country or bedrock over the vein, so as to cut it just in the body of mineral for better ventilation and greater convenience, speed and economy in extraction. It will be also advisable to keep driving the bottom level southward by a small corps of men under the large body of ore seen at the surface just south of the shaft, and to explore the vein for other deposits.

Best Method for Reducing the Ores into Metal.

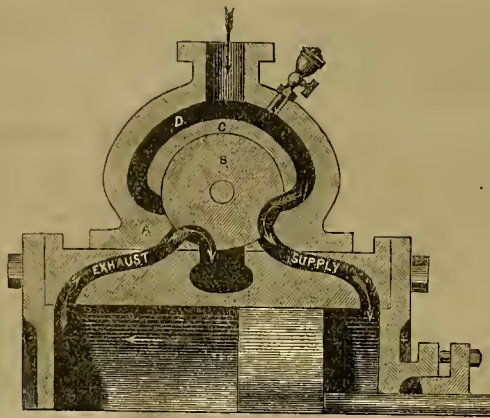
The constitution of the ores are, at the present time, favorable for smelting, every necessary element being present in very suitable proportion for reducing the comparatively moderate quantity of the most refractory sulphuret of lead. The carbonate of lead smelts easily in itself and favors the galena, whilst there is sufficient carbonate of lime as a reducing flux for

ficial purpose of concentrating such ores for the enrichment of your bullion, as this would add but little to the expenses of smelting and procure a higher value, not only for what has been thus added, but for all the silver contained therein.

The Tallant Patent Circular Slide Valve.

Perhaps comparatively few engineers are aware of the enormous waste of power, and consequently of money, caused by imperfect and unbalanced slide valves in steam engines; yet so important has this matter been considered that some 200 patents have been granted on improvements and inventions for the better distribution of steam in steam engines and methods of reducing the power required to operate the same. The countless number of devices by which it has been attempted to evenly balance the pressure on the top of the common slide valve have cost fortunes, and few of the many have proved of value. When the inventor has been successful in overcoming this pressure, it has been at the sacrifice of simplicity, and the care required to keep them in order has created prejudices against most all others which have been proposed.

The well known English engineer, Mr. W. G. Beattie, in an article published in the *London Artisan*, gives the following results from a number of careful indicator tests made by him: "An ordinary locomotive slide valve ten inches long by seventeen inches in width makes an area of 170 square inches under steam pressure for an engine of seventeen inch cylinders, at 126 pounds pressure of steam in the valve chests; this amounts to a pressure of 22,000 pounds. From this must be deducted the pres-



TALLANT'S BALANCED CIRCULAR SLIDE VALVE FOR STEAM ENGINES.

the iron oxide to aid the reduction of the sulphuret of lead by its strong affinity, causing the double sulphide reaction with iron. For these reasons the preliminary roasting of the sulphuret of lead will be unnecessary, provided the heavy slugs are closely watched, and occasionally recharged, both as a valuable fluid flux, and to reduce the stubborn sulphide of lead, which they sometimes retain, to metal.

As the mine is deepened I think the carbonate of lead will lessen and sulphuret prevail, when it will become necessary to roast before smelting to metal.

If I were smelting this ore I should use a cheaper and more efficient furnace than has been used in this region, but as the journeymen are familiar with those used at Cerro Gordo, it may not be advisable to introduce other modes.

Summary of Facts Favorable to the Mines.

The mines are located in a dry climate, and sufficiently high for the drainage of the ground around the vein, so that little pumping power will ever be required. The enclosing rocks are soft and easily mined.

The vein itself can be also cheaply worked, and is unusually well defined, having the laminations and walls of a true fissure and a strongly corrugated slickenside, which is the best possible proof of great extent of fissure.

Costs for mining, carriage by descending grade and smelting are comparatively light, and can be carried on all the year. The large amount of valuable ore at the surface and in sight below, both in length and probable depth, and unmistakably evidence for long continuance.

The costs for smelting are not very heavy, as charcoal can be obtained at 32 cents per bushel.

The railway is gradually approaching, and the carriage of bullion thus saved will be added to the gradually increasing profits.

The small amount of labor expended for the superior results obtained in such a short time.

In conclusion I may therefore say that few mines have been opened under more favorable auspices, or produced more for the extent worked, and with the foregoing facts before me I can see no reason why you may not disburse dividends in a very short time after the furnace you have already leased is in successful operation.

I would still further suggest to you the great advantage that would accrue from the buying of rich silver ore from prospectors or getting a rich silver ore vein, for the very bene-

to which it has been applied, with even less consumption of fuel than before. The greatest loss of power with the ordinary slide valve is when the piston is just completing its stroke and has no control over the crank. At this time, the cylinder being empty of steam, there is no lift to the valve from back pressure, while the pressure on top of it from the steam in the boiler is even greater than ever. With this invention it makes no difference where the piston may be, as there is no pressure on the valve at any time. That this is the case may be plainly seen in the motion of any engine fitted with the circular slide valve.

Conceding the value of the principle on which this valve is constructed, practical engineers have objected to its supposed liability to ent and wear and leak steam, and thus become useless in a short time. The experience of several years has proved this objection to be without any foundation in fact. By using any one of the self-feeding oil cups now in general use, a small but constant supply of oil may be furnished the valve, which in three years' constant use has prevented any perceptible wear whatever, the tool marks not having scored out in that time or the valve having even become bright. Practice has proved also that the valve will not ent, even if oil is withheld from it. It will groan and give fair notice of the neglect, and in cases of gross negligence, will stick fast like a hoggy wheel without oil, and the stem twist off. With the most ordinary care, and with less than half the supply of oil required by the common slide valve, there is never any trouble whatever.

The advantages claimed for this device are: First, A total absence of unbalanced pressure and consequent saving of friction. So complete is this that the valve can be shifted with one hand on any sized engine under steam pressure with perfect ease, which would be impossible with the ordinary valve. Second, Consequently a celerity of movement which no other device gives. The ease with which the crank passes the center must be seen to be appreciated. Third, Instead of requiring a large portion of the steam power in the boiler to move the valve, as in the case with the old style, this valve is self-moving, the shape of the grooves being such that the instant steam is admitted it moves itself, the eccentric simply starting, regulating and checking it. Fourth, Instead of the steam being admitted on the top and pressing the valve down, this device is so arranged that the steam enters on each side below the center, lifting the valve up, thus to a certain extent overcoming the weight of metal of which it is made, and reducing the force required to move it to an absolute minimum. Fifth, The arrangement for cut-off, expansion of steam while working in the cylinder, and releasing, are so perfect that all of the force of the steam in the boiler is reserved for labor or duty, the valve simply forming a direct tube from the boiler to the head of the piston in the cylinder, capable of being shifted many times a minute to the other side without any waste of power whatever; hence, much less steam is required and consequently much less water to be evaporated or fuel to convert it into vapor.

This invention is so simple as to be readily understood by a glance at the cut. It is a complete substitute for the common slide valve now in universal use. It is adapted for locomotives, steamboats, propellers and stationary engines, an improvement that no user of a steam engine can afford to leave unexamined. These valves are manufactured and applied to existing and new engines by W. W. Hanscom, of the Hope Iron Works, at the Potrero, where Mr. Hanscom will be pleased to show the action of the valve and many testimonials of its use where it has been in perfect condition for years without repairs, wear or deterioration.

JAPANESE AGRICULTURAL COLLEGE.—According to the *Springfield Republican*, our agricultural college experiment is to be repeated in Japan. The Japanese government have been for some time endeavoring to engage President W. S. Clarke to found for them an agricultural institution after the plan of the one at Amherst. The trustees have granted him a year's absence, and such arrangements will be made that it is believed his going will not prove injurious to the Massachusetts college. Ample capital will be furnished. Col. Clarke is authorized to engage his assistants, and in every way to conduct the undertaking after his own methods. A special minister has been in the country effecting the arrangement.

THE San Francisco art association has just closed a very meritorious exhibition. Those who have been in the city during the past few weeks without visiting its room have missed such a treat as they cannot realize. The school of design for pupils over 14 years of age commences a new term on Monday next. Address Virgil Williams, at the rooms of the association, No. 313 Pine street, San Francisco, for particulars.

SENATOR SARGENT has introduced a bill which ought to be, and probably will be soon passed, and thus abate the silver nuisance, from which workmen and others suffer on the Pacific coast. He proposes to make the trade dollar a legal tender at its nominal value for any amount not exceeding \$20 in any one payment; the silver half-dollar a legal tender for amounts up to \$10; and the 25c., 20c. and 10c. coins a legal tender for single payments not exceeding five dollars.

Jersey District.

James A. Hill, R. C. Reeves and S. J. Chambers left here last Saturday, says the *Silver State*, on a trip to Jersey district, which is attracting considerable attention at the present time. They returned last evening and furnished us the following relative to the new camp:

Jersey district is situated about 60 miles east of south from Winnemucca. There are about 100 men at present in the camp, and several new buildings are in course of erection, among them one intended for a hotel, which is being built by Messrs. Laveaga and Hawley of Unionville.

The Mine

Was discovered about two years ago by Len Tremble, of Galena. It has paid its way from the beginning, the ore having been shipped to California and Europe for reduction. It was purchased of the original owners last November by Frank Hamilton, J. Sevenoaks and others for \$40,000 in coin and one-tenth of the capital stock. The course of the vein is north and south, dipping west. It is from 10 to 12 feet wide, and carries on an average four feet of galena and about five feet of carbonate of lead. A ravine runs at right angles with the course of the ledge. From this ravine the vein is prospected north by a tunnel 300 feet long, and south by a tunnel 50 feet long. A shaft is sunk on the ledge in the south tunnel to a depth of 25 feet below the level. The vein is of uniform width as far as prospected and is well defined. The average assay of the cropings is \$195.63 silver to the ton and 76 per cent. lead; of the dump \$78 per ton in silver and 33 per cent. lead; at the bottom of the shaft \$126.69 in silver, and 70 per cent. lead. The quantity of ore on the dump is estimated at 1,500 tons.

The Furnace

Is completed and its net capacity is 40 tons of ore a day. It will require from 800 to 1,000 bushels of coal daily to run it to its full capacity. It will be fired up on the 4th of February, from which time it is expected an average of 10 tons of bullion will be produced daily. A large force is now engaged in chopping wood and burning coal in the Austin range, about 25 miles southeast of the mine, and another party of choppers and coal burners will be set at work shortly in the second east range, south of Clark's ranch, where there is an inexhaustible supply of nut pine and cedar wood.

Other Prospects.

The ledge has been traced 3,000 feet north of the Jersey company's works, and south to a considerable distance. An extension of the lead is owned by Robert McBeth, and the prospects of finding an extensive body of ore are very encouraging. Mines have been discovered and locations made north and south of the Jersey for three or four miles. When the works are in full blast some 10 or 12 ten-man teams will be required to haul coal to the furnace and bullion to the railroad. They want a post office established at Jersey City, with semi-weekly communication with the railroad, and have signed a petition to that effect.

THE LAW OF INCORPORATION.—Judge Wright has granted a nonsuit in the case of A. P. Needles against J. W. Pearson. The suit was brought to recover damages, sustained by Needles, for being refused access to the books of the Woodville mining company after he had exhibited evidence that he was a stockholder. Justice Joachimsen rendered judgment for Needles for the amount claimed, and the defendant appealed the case to the County Court. Judge Wright decided that the law requires that the original incorporation shall be filed with the County Clerk, and a certified copy be deposited with the Secretary of State. That official is required to send to the company incorporating a certificate that the incorporation law has been complied with. The plaintiff failed to produce such a certificate and prove a legal incorporation, and the court therefore granted a nonsuit.

Rumor states that a narrow gauge railroad is contemplated to connect Sebastopol with Santa Rosa.

Mining Superintendent.

E. B. Smith, for nearly twenty years engaged in the direction of mines and mining enterprises, can be engaged to take charge of any legitimate mining enterprise. Mr. Smith thoroughly understands the "Sonora" process of chlorination and lixiviation, being the originator of the same, and the erection of all machinery and furnaces for the treatment of rebellious ores. Office—439 Bush street, S. F.

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SANBORN & BYRNES.



Mechanics' Mills, Mission Street,
Bet. First and Fremont, San Francisco. Orders from the country promptly attended to. All kinds of Stair Material furnished to order. Wood and Ivory Turners. Billiard Balls and Ten Pins, Fancy Newsels and Ballstesters.
25v8-8m-hp

SAN FRANCISCO

Pioneer Screen Works,

Removed to 32 Fremont Street, near Market.

J. W. QUICK,



Manufacturer of perforated sheet metals of every description, at reduced rates. Mill owners using Battery Screens extensively, can contract for large supplies at favorable rates. This is the only establishment on the Coast devoted exclusively to the manufacture of Screens

WIRE ROPE

For Mining, Shipping, and General Purposes.

All kinds and sizes on hand, or made to order; guaranteed of unsurpassed quality, and manufactured of any length. FLAT ROPES, ROUND ROPES and TAPER ROPES, OF IRON OR STEEL.

Patent Endless Wire Ropeway

(WIRE TRAMWAY.)

FOR THE RAPID AND ECONOMICAL TRANSPORTATION OF ORES AND OTHER MATERIAL OVER MOUNTAINOUS AND DIFFICULT ROADS.

This system has been in use for over three years, and given thorough satisfaction.

PATENT GRIP PULLEY,

For transmission of power by means of wire ropes

WIRE.

Fencing Wire and Staples,

WING WIRE,

SPRING WIRE,

GALVANIZED WIRE,

BROOM WIRE,

STEEL WIRE,

COPPER WIRE,

BRASS WIRE,

And Wire of all kinds, on hand or made to order.

SOLE AGENT FOR

Richard Johnson and Nephews' Celebrated Telegraph Wire.

Full stock on hand in bond, or duty paid.

Wire Cloth and Wire Netting.

FULL ASSORTMENT ON HAND FOR ALL PURPOSES, AND

All Kinds of Goods in the Wire Line.

Send for Circulars, Etc., to

A. S. HALLIDIE,

113 and 115 Pine Street, S. F.

LEVI STRAUSS & CO.,

Patent Riveted

Clothing,

14 & 16 Battery St.,

San Francisco.



These goods are specially adapted for the use of FARMERS, MECHANICS, MINERS, and WORKING MEN in general. They are manufactured of the Best Material, and in a Superior Manner. A trial will convince everybody of this fact.

Patented May 12, 1873.
USE NO OTHER, AND INQUIRE FOR THESE GOODS ONLY.
6v16-3m

OF INTEREST TO

MINING COMPANIES.

A Mining and Civil Engineer, of long experience, collected in Europe and America, well acquainted with correct management of mines and mills, practiced in projecting and constructing mining and milling machinery, and especially machinery for mechanical ore concentration, is open for re-engagement, and would prefer the task of constructing works for mechanical concentration of low grade ore on a well developed mine, or of remodeling ineffective works in the ore milling line for successful operation. Apply to Messrs. DEWEY & CO., of this office, for reference.

Office of Drain Pipe Works

S. W. Corner Sacramento and
Montgomery Sts.,
S. F.

DRAINS

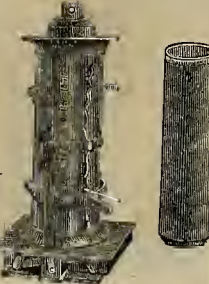
CONSTRUCTED

In any part of the State, and

Work Warranted

E. T. MENOMY

Proprietor.



Metallurgy and Ores.

JOHN TAYLOR & CO.,

IMPORTERS OF AND DEALERS IN

ASSAYERS' MATERIALS

Chemical Apparatus and Chemicals, Druggists Glassware and Sundries, etc.

512 and 518 Washington street, SAN FRANCISCO

We would call the special attention of Assayers, Chemists, Mining Companies, Milling Companies, Prospectors, etc., to our large and well adapted stock

ASSAYERS' MATERIALS

—AND—

Chemical Apparatus,

Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast. Our Gold and Silver Tables, showing the value per ounce Troy at different degrees of fineness, and valuable tables for computation of assays in Grains Grammes, will be sent free upon application.

7v25-tf

JOHN TAYLOR & CO.

Nevada Metallurgical Works,

21 First street.....San Francisco.

Ores worked by any process.
Ores sampled.
Assaying in all its branches.
Analysis of Ores, Minerals, Waters, etc.
Plans furnished for the most suitable process for working Ores.
Special attention paid to the Mining and Metallurgy of Quicksilver.

E. HUHN,

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Mining Engineers and Metallurgists.

RODGERS, MEYER & CO.,

COMMISSION MERCHANTS,

ADVANCES MADE

On all kinds of Ores, and particular attention

PAID TO

CONSIGNMENTS OF GOODS.

4v16-3m

Instructions in Assaying,

Chemical Analysis, Determination of Minerals, and use of the Blow-pipe.

HENRY G. HANKS

Will receive a few pupils at his new laboratory, 617 Montgomery street, up-stairs. TERMS MODERATE

LEOPOLD KUH,

(Formerly of the U. S. Branch Mint, S. F.)

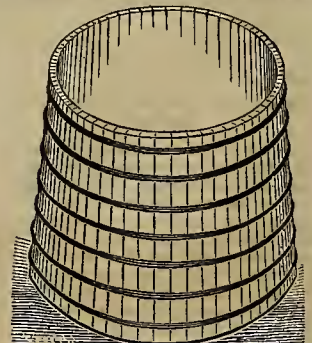
Assayer and Metallurgical CHEMIST,

No. 611 Commercial Street,

(Opposite the U. S. Branch Mint.

SAN FRANCISCO CAL.

7v21-3m



WATER TANKS of any capacity, made entirely by machinery. Material the best in use; construction not excelled. Attention, dispatch, satisfaction. Cost less than elsewhere.

WELLS, RUSSELL & CO.,

Mechanics' Mills, Cor. Mission & Fremont Streets,

3v28-3m-ss

Diamond Drill Co.

The undersigned, owners of LESCHOT'S PATENT for DIAMOND-POINTED DRILLS, now brought to the highest state of perfection, are prepared to fill orders for the IMPROVED PROSPECTING and TUNNELING DRILLS, with or without power, at short notice, and at reduced prices. Abundant testimony furnished of the great economy and successful working of numerous machines in operation in the quartz and gravel mines on this coast. Circulars forwarded, and full information given upon application.

A. J. SEVERANCE & CO.

Office, No. 315 California street, Rooms 1 and 2.

24v26-tf

Machinery.

The Ingersoll Rock-Drill



Is Extensively Used in the East and

TAKES THE PLACE OF ALL OTHERS, Whichever introduced, because it can be run with less power, labor and repairs, and do more work than any other Drill in the market. It has but few parts, is easily handled, being light, and HAS AUTOMATIC FEED, which saves labor. WE ASK FOR TRIAL AGAINST ANY COMPETITOR. For particular information regarding Drills or Air Compressors, send for circular to

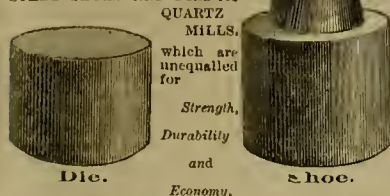
J. B. REYNOLDS,

Room 1, 315 California Street.

STEEL SHOES AND DIES

FOR QUARTZ MILLS,

Made by our improved process. After many years of patient research and experiment we have succeeded in producing STEEL SHOES AND DIES for



Will wear three times longer than any iron Shoes.

BUILDERS AND CONTRACTORS

Of Quartz Mills, Pans, Reparaturs, Concentrators, Jigs, Hydraulic Rock Breakers, Furnaces, Engines, Boilers and Shaiting, and General Mining Machinery in all its details, and Furnishers of Mining Supplies. All orders promptly filled.

MOREY & SPERRY,

88 Liberty street, N. Y.

Examination solicited.

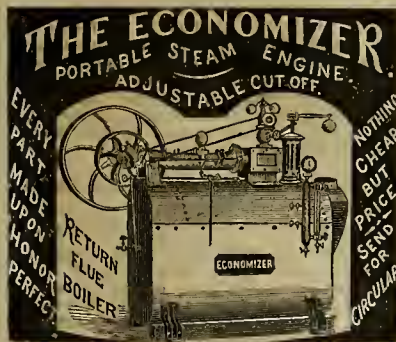
MODEL STEAM ENGINES.

From 50 cents upwards, from Geo. Parr's Unequalled Models of

Steam Cranes, Vertical Engines, Circular Saws, Paddle Engines, Steam Lathes, Steam Hammers, Horizontal Steam Boilers, Locomotive Engines, Portable Steam Pumps, Marine Screw, Beam Steam Winches, Fire Engines, Water Motor, Electro, requires no fuel, Unright Engine, Miniature Mach. Shop Engines to run with Kerosene Oil or Gas for domestic purposes. Miniature Mechanical and Comical Figures and Saw Mills run by above appliances. Also, Celebrated Amateur's Lathes, Tools and Fittings of every description. Immitable Castings, for \$1.00 per set and upwards, by means of which the numbers of the above Steam Engines, Lathes, &c., have been successfully made by Amateurs. Thousands prove the unparalleled success of the above models and castings.

For full description and prices of the above, together with the requisite tools, see "Parr's Technical Guide," 8vo., Eighth edition, Sixty-fifth thousand, over 150 pages with nearly 800 splendid illustrations, giving full instructions in Sorrento Fret Sawing and "H Sawing, and 150 Parlor Experiments in Chemistry, the wonders of Microscopy, the beauties of model Telegraphy, together with other useful and scientific information; also, all necessary instructions how to buy, how to use, and how to make model engines. Post free, 30 cts. Address GEO. PARR, Manufacturer of Mechanic's Tools, BUFFALO, N. Y.

DUNHAM, CARBON & Co., S. F., are Sole Agents in California for my Heavy Wood Working Machinery.



—FOR—

Cotton Gins, Printers, Cheese Makers, Laundries, Cabinet Makers, and All Manufacturing whers Light Power is Required.

A. L. FISH & CO.,

Sole Agents for California,

9 and 11 First Street, - - San Francisco.

THORNE, DeHAVEN & CO.

21st Street, above Market, PHILADELPHIA.

DRILLING MACHINES.

PORTABLE DRILLS. Driven by power in any direction, self-feed and convenient adjustment.

RADIAL DRILLS. Self-feed—large adjustable box table—separate base plate, every convenience.

VERTICAL DRILLS. Self-feeding—of new and improved designs.

MULTIPLE DRILLS. For boiler work, etc., 2 to 20 spindles, fed and returned by power or hand, together or separately.

HORIZONTAL BORING AND DRILLING MACHINES. For large pieces—with boring head, adjustable, vertically and horizontally.

SPECIAL DRILLS. For special work. Gun Blank Drills, Coal Drills, &c., built to order.

CALIFORNIA WINE COOPERAGE AND MILL CO

30, 32, 34, 36, 38 & 40

Spear Street,

M. FULDA & SONS

Proprietors.

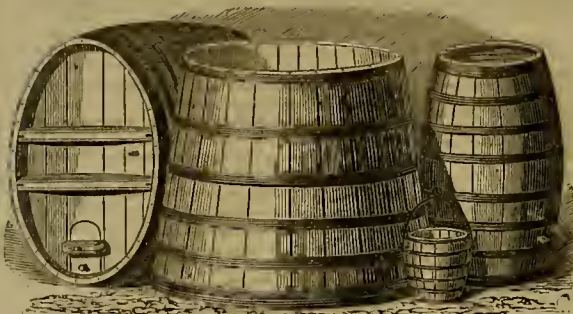
Manufacturers of

WATER TANKS SHIP TANKS, MINING WORK,

WINE, BEER AND LIQUOR OAKS, TANKS, ETC.

Cooperage and Tanks, Steamed and Dried Before or After Manufacture at Reasonable Rates.

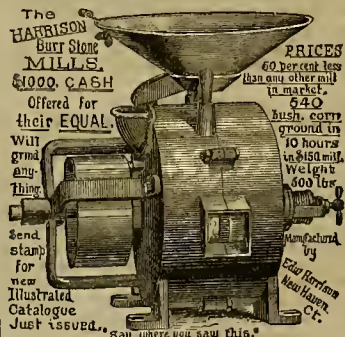
Sawing, Planing, etc. at Short Notice. cwwbp



GOLD, SILVER AND COPPER MINING. Reducing and Concentration Machinery.



Address, FRASER, CHALMERS & CO., Chicago, Ill.



G. W. & C. A. LANE, Exeter, N. H., write, Dec. 13:

"We started the heavy 20-inch Corn Mill last Friday you sent to Baldwin & Talbot, Manchester, N. H. We ran it most all day, and ground 60 bushels corn per hour. The mill you sent us at Haverhill, Mass., for A. S. Hook, is doing wonderfully. It is grinding on an average 2,500 lbs. good meal per hour, and has ground 2,800 lbs. in an hour. It is driven by an engine with a 9-in. cylinder, and takes the place of a 30-in. mill of another kind that, when doing its best and loading the engine with all it could carry, only ground 1,500 lbs. per hour. If there is a mill built that can beat that we would be pleased to see it brought out."

AUTOMATIC PUMP.

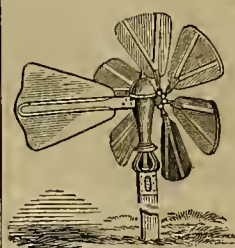
Raises water by compressed air to any height or distance. Windmill can be set at any distance from the well or spring if required to get a good exposure to the wind.

SEND FOR CIRCULAR.

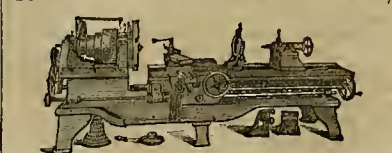
J. E. HOLLOWAY, Gen. Agent for Pacific States,

31 Beale Street, San Francisco,

WHERE THE PUMP CAN BE SEEN IN OPERATION.



EDWIN HARRINGTON & SON,



Manufacturers of ENGINE LATHES, 48 inches swing and smaller; VERTICAL BORING MACHINES, suitable for jobbing and boring Car Wheels; UPRIGHT DRILLS, 36 inches and smaller, and other Machinists' Tools.

COR. NORTH FIFTEENTH ST.

AND PENNSYLVANIA AVENUE,

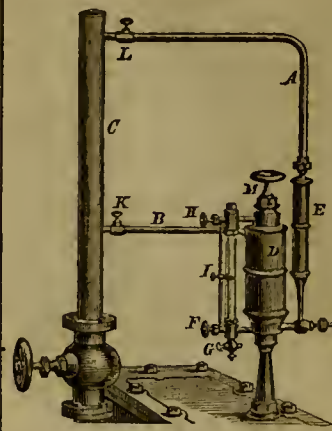
Philadelphia, Pennsylvania.

Barnes' Patent Foot and Steam Power Scroll Saws and Lathes.

For the entire range of Scroll Sawing, from the finest ornament to the coarse bracket, three inches thick. VARIETY.—We warrant that a man with ordinary experience can, with this Foot Power Machine, saw through the following kinds of lumber line measure: Pine, 3 in. thick, 1 foot per minute; 1 in. thick, 4 ft. per min.; Walnut, 3 in. thick, 2 ft. per min.; 1 in. thick, 2 ft. per min. Address for full particulars, W. F. & JOHN BARNES, Rockford, Winnebago Co., Illinois.

THE MINING AND SCIENTIFIC PRESS is the leading journal of America. New processes and mechanical inventions are illustrated and discussed in its weekly issues. It is a 16-page sheet, handsomely printed, for \$4 per year. Dawsey & Co., publishers, San Francisco. —[Mt. Lincoln Naws, Alma, Colorado.

N. Seibert's Eureka Lubricators.



THE HIGHEST PREMIUM

Awarded by the Mechanics' Institute Fair, San Francisco, and State Fair, Sacramento, 1871.

These Lubricators are acknowledged by all engineers to be superior to any they have ever used; feed constantly by pressure of condensed water, supplied by pipe A, regulated under the oil by valve J, and forced out through check valve and pipe B into the steam pipe C; it then becomes greasy steam, passes to all the valves and cylinder at every stroke of the engine; glass tube I indicates amount used per hour. Packing on rods and stems lasts longer, and the rings on the piston will not corrode. One pint of oil will last from three to six days, according to speed and size of engine; I, sliding gauge; K, valve to shut off when engine stops; H, F, valves to shut off in case of frost; steam does not enter the cup; it is always cool; warranted to give satisfaction. Patented February 14, 1871. Made by California Brass Works, 126 First street, S. F. 24v23

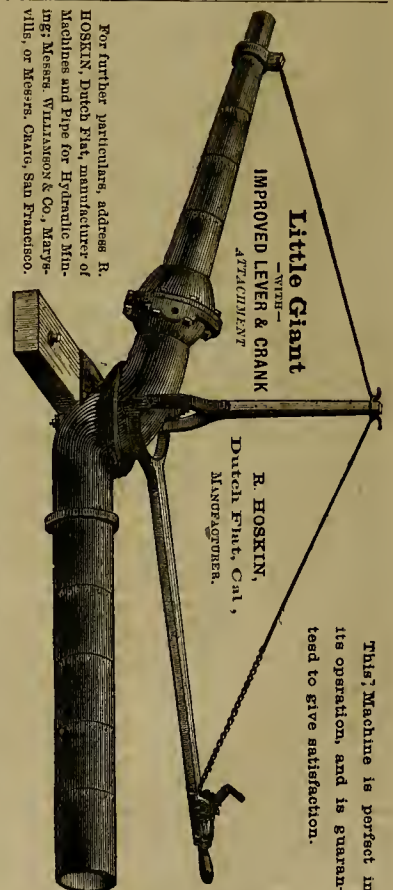
STEAM ENGINES & BOILERS

From 3 to 75-horse power. Shafting, Pulleys, Hoist Gears, Quartz Mills, Water Tanks, Spanish Arrastras, Pumps and Pipes, Hoopburn and Belden Pans, and all kinds of Machinery for sale at lowest prices by

THOS. P. H. WHITE LAW,

266 Brannan street, S. F.

Highest cash prices paid for all kinds of Machinery.



F. MANSELL & CO.,

SIGN PAINTERS,

423 PINE STREET,

(Between Montgomery and Kearny.)

Persons engaged in the following business can have their Signs Painted at contract prices, for goods or articles in which they trade, viz:

Merchant Tailors, Gents' Furnish'g G'ds, Bootmakers, Furniture Dealers, Hatters, Jewelers, Hotels, Piano Fortes, Wine Merchants, Etc., Etc.

Glasgow Iron and Metal Importing Co.

Have always on hand a large stock of Bar and Bundle Iron, Sheet and Plate Iron, Boiler Flues, Gas and Water Pipe, Cast Steel, Flaw and Shear Steel, Anvils, Cumberland Coal, Etc.

WM. McGRINDLE, Manager, 22 & 24 Fremont St., S. F. m2-m2

e it. Yet when menaced by a violent cough or cold, or
e any disease leading to consumption, a single dollar
c invested in **HALE'S HONEY OF HOREHOUND AND TAR** will

METALS.

[WHOLESALE.]

WEDNESDAY M., February 9, 1876.

American Pig Iron, 4 ton	38 00	36 00
Roots Pig Iron, 4 ton	35 00	37 00
White Pig, 4 ton	35 00	38 00
Oregon Pig, 4 ton	35 00	38 00
Redhead Bar, bad assortment, 4 ton	35 00	38 00
Boiler, No. 1 to 4	35 00	38 00
Plate, No. 5 to 8	35 00	38 00
Sheet, No. 10 to 14	35 00	38 00
Sheet, No. 16 to 20	35 00	38 00
Sheet, No. 22 to 24	35 00	38 00
Sheet, No. 26 to 28	35 00	38 00
Horse Shoes, per keg	6 00	8 00
Nail Rod	9 00	10 00
Norway Iron	9 00	10 00
Roller Iron	9 00	10 00
Other Irons for Blacksmiths, Miners, etc.	9 00	10 00
COPIERS—		
Brass	35 00	40 00
Copper Tinned	35 00	40 00
U. S. Patent	35 00	40 00
Sheathing, Yellow	35 00	40 00
Sheathing, Old Yellow	35 00	40 00
Composition Nails	35 00	40 00
Composition Bolts	35 00	40 00
Steel—English Cast, 4 ton	35 00	40 00
Anderson & Woods' American Cast	35 00	40 00
Drill	35 00	40 00
Flux Steel	35 00	40 00
TIN PLATES—		
10x14 1/2 Charcoal	10 00	11 00
10x14 1/2 Charcoal	10 00	11 00
Roofing Plate 10 Charcoal	10 00	11 00
Randa Tin	10 00	11 00
Australian	10 00	11 00
Sheet, 12 1/2 ft. No. 7 to 10 1/2	10 00	11 00
do 7 1/2 ft. No. 11 to 14	10 00	11 00
do 8 1/2 ft. No. 15 to 18	10 00	11 00
do 9 1/2 ft. No. 19 to 22	10 00	11 00
NAILS—American sizes	3 00	3 75
FOREIGN R. S. S.	72 00	75 00

LEATHER.

[WHOLESALE.]

WEDNESDAY M., February 9, 1876.

City Tanned Leather, 4 ton	22 00	24 00
Santa Cruz Leather, 4 ton	22 00	24 00
Country Leather, 4 ton	22 00	24 00
Stockton Leather, 4 ton	22 00	24 00
Jeet, 8 Kil. per doz.	85 00	79 00
Jeet, 11 to 13 Kil. per doz.	82 00	79 00
Jeet, second choice, 11 to 13 Kil. per doz.	81 00	79 00
Jeet, 12 to 13 Kil. per doz.	81 00	79 00
Jeet, 14 to 15 Kil. per doz.	81 00	79 00
Jeet, 16 to 17 Kil. per doz.	81 00	79 00
Jeet, 18 to 19 Kil. per doz.	81 00	79 00
Jeet, 20 Kil. per doz.	81 00	79 00
Jeet, 21 Kil. per doz.	81 00	79 00
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Jeet, 95 Kil. per doz.	81 00	79 00
Jeet, 96 Kil. per doz.	81 00	79 00
Jeet, 97 Kil. per doz.	81 00	79 00
Jeet, 98 Kil. per doz.	81 00	79 00
Jeet, 99 Kil. per doz.	81 00	79 00
Jeet, 100 Kil. per doz.	81 00	79 00

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by CHARLES SUTZ & Co.]

SAN FRANCISCO, February 9, 3 P. M.

LEGAL TENDERS IN S. F., 11 A. M., 89 1/2 to 89 3/4.	
GOLD IN N. Y., 112 1/2.	
GOLD BARS, 900, SILVER BARS, 7 1/2 and 8 per cent. discount.	
EXCHANGE ON N. Y., 60-100 per cent. premium for gold; on London bankers, 49; Commercial, 49 1/2; Paris, five francs per dollar; Mexican dollars, three to five per cent. discount.	
LONDON—Consols, 93 to 93 1/2; Bonds, 102 1/2.	
QUICKSILVER IN S. F., by the flask, per lb. 72 1/2 to 75.	

UNITED STATES

Mineral Land Laws, Revised Statutes, And Instructions and Forms under the Same.

We have just issued a pamphlet containing the general mineral land laws of the United States, with instructions of the Commissioner of the Land Office. The contents of this pamphlet comprise all of the Government laws with relation to mineral lands of interest to the mining community, as follows: Mining Statute of May 10th, 1872, with Instructions by the Commissioner of the Land Office; Mining Statute of July 26th, 1866; Mining Statute of July 9th, 1870; Forms required under Mining Act of May 10th, 1872, as follows: Notice of Location; Request for Survey; Application for Patent; Proof of Posting Notice and Diagram of the Claim; Proof that Plat and Notice remained Posted on Claim during Time of Publication; Register's Certificate of Posting Notice for Sixty Days; Agreement of Publisher; Proof of Publication; Affidavit of \$500 Improvements; Statement and Charge of Fees; Proof of Ownership and Possession in Case of Loss or absence of Mining Records; Affidavit of Citizenship; Certificate that no Suit is Pending; Power of Attorney; Protest and Adverse Claim; Non-Mineral Affidavit; Proof that no Known Veins Exist in a Placer Claim. There is also given the U. S. Coal Land Laws and Regulations thereunder. The work comprises thirty pages, and will be sold, post-free, for 50 cents. It should be in the hands of every one having any mining interests. DEWEY & CO., Publishers of MINING AND SCIENTIFIC PRESS, S. F.

IMPROVED.—Dewey & Co., publishers of the MINING AND SCIENTIFIC PRESS and the RURAL PRESS, now have the leaves of both these sixteen page sheets cut and stitched, which is an improvement that all readers of that otherwise inconvenient form of journal will appreciate very much. Every farmer would be a gainer were he to subscribe for the RURAL. It is decidedly a valuable paper, and the SCIENTIFIC PRESS is no less so to mining men.—Inyo Independent.

THOUGHTLESSNESS.—Persons sometimes return their paper, marked "stop this paper." Their name being pasted on the sheet they think that is all we need to be able to cross their names off. Now that is thoughtlessness. Your P. O. address is needed as much as your name. We have thousands of names arranged only according to locality. Our mailing clerk does not know where everybody lives.

THE MINING AND SCIENTIFIC PRESS is one of the best papers published on this coast. It should be in the hands of every miner and mechanic in the State. The issue of last week contained an excellent article on the gold product of this coast.—Oroville Mercury, Jan. 28th.

GIVE YOUR FULL ADDRESS when you communicate on business to this office, especially in returning newspapers. The fact that your name is on our subscription list is of no assistance to us. Without sending your post office address we should have to look over thousands of names to find yours.

[PUBLISHERS' ANNOUNCEMENT.]

MINING AND SCIENTIFIC PRESS

For 1876.

THIS PUBLICATION, SO VALUABLE FOR MINERS, MECHANICS AND MANUFACTURERS,

Will enter upon its THIRTY SECOND Semi-Annual Volume on Saturday, January 1st, 1876. It has ever been and will still continue to be the aim and object of the publishers to make the Press

A Practical and Interesting Journal.

To this end, we aim, through the constant watchfulness of our editors and correspondents, to seize upon everything new in the way of mining and the various processes connected with the saving and separating of the precious metals, and place the same before our readers at the earliest day. It has been well said that

A Newspaper is a Window

Through which men look out upon all that is going on in the world. Our window is a special one, so placed and arranged as to bring within the scope of its vision all that is going on

In the World of Mining, Mechanics and Science.

Without a paper of this kind, the miner or mechanic is shut up in a small room or shop and can know but little of what is going on in the world around him in relation to his particular calling. In this age of rapid progress books are necessarily slow and behind the times. It is only through papers devoted to the specialty which he has chosen that one can be easily apprised of the discoveries and improvements which are constantly being made by his fellow workers, and without a knowledge of which he soon becomes a laggard in the race.

The Value to the Community

Of such publications in disseminating important information, in checking useless and exploded experiments and in instigating important enterprises, can scarcely be overrated. Through them the readings and observations of thousands are collected and collated, and brought directly to the shop or table of the reader, without any effort of his own. For a mere trifle of cost he is regularly furnished with an encyclopedia of just the information he needs—an unbound book forever lasting but never finished.

Nowhere in the Wide World

Is such an aid more needed than by the miner of California. It is needed alike in the mill, in the mine and in the placer. We have here

The Largest Mining Field on the Globe,

Embracing a variety of minerals nowhere else found within the boundaries of a single field. We have here also, men gathered from every quarter of the globe bringing with them the collective wisdom of the world.

Useful, Practical and Directly from the Field

Of labor. The minstiness of hooks has been hushed away, and their minds are stored not only with the experience of the past, but also with the practice of the present. It is to this fact that we are indebted for our present

Able List of Correspondents,

Through whom we are able to promise to our readers so much that cannot be collected in the mere routine of office work. By the aid of such help our editors will be able, during the coming year, to do more than ever in furnishing information which shall be

Fresh, Novel and Interesting,

And which shall comprise all that is known of the latest and best means for saving gold and silver, and for economizing labor and cost in that direction.

Our Illustration Department

Will still continue to form an important feature, and no effort will be spared to make it of the greatest possible local and general interest to our readers. The important matter of

Home Manufactures and Inventions

Will also largely occupy the attention of the publishers and editors, and will be constantly encouraged, as an important means of furnishing employment to those who are seeking our shores, and adding to the wealth of the Pacific coast.

The Large and Increasing Circulation

Of a journal thus devoted exclusively to useful and practical information, speaks more in our behalf than anything we could say of ourselves, and is an encouragement to its further increase, especially in these times of trying and troublous journalism.

The class of readers who are interested in such a publication as this, have no need to be anything more than merely reminded that such journals are necessarily more costly than those of a lighter class, such as are read by the "million" and thrown aside as soon as read. Considering the character and location of the MINING AND SCIENTIFIC PRESS, our rates are as favorable as can possibly be afforded and do justice to the great industries in aid of which we are laboring.

A Handy Map

Of California and the principal portion of Nevada will be furnished free to all subscribers who pay one year in advance, during the year 1876. The map is plain, printed on tinted paper, about 16x20 inches, showing townships in California, and the counties, railroads and principal towns in California and Nevada.

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In addition to American Patents, we secure with the assistance of co-operative agents, claims in all foreign countries which grant Patents, including Great Britain, France, Belgium, Prussia, Austria, Victoria, Peru, Russia, Spain, British India, Saxony, Mexico, Colombia, Canada, Norway, Sweden, British Columbia, Brazil, Bavaria, Holland, Denmark, Italy, Portugal, Cuba, Roman States, Wrttemberg, New Zealand, New South Wales, Queensland, Tasmania, Brazil, New Grenada, Chili, Argentine Republic, and EVERY COUNTRY IN THE WORLD where Patents are obtainable.

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We can and do get foreign patents for inventors in the Pacific States from two to six months (according to the location of the country) sooner than any other agents.

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We take great pains to preserve secrecy in all confidential matters, and applicants for patents can rest assured that their communications and business transactions will be held strictly confidential by us. Circulars free.

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Our long experience in obtaining patents for Inventors on this Coast has familiarized us with the character of most of the inventions already patented; hence we are frequently able to save our patrons the cost of a fruitless application by pointing them to the same thing already covered by a patent. We are always free to advise applicants of any knowledge we have of previous applicants which will interfere with their obtaining a patent.

We invite the acquaintance of all parties connected with inventions and patent right business, believing that the mutual conference of legitimate business and professional men is mutual gain. Parties in doubt in regard to their rights as assignees of patents, or purchasers of patented articles, can often receive advice of importance to them from a short call at our office.

Remittances of money, made, by individual inventors to the Government, sometimes miscarry, and it has repeatedly happened that applicants have not only lost their money but their inventions also, from this cause and consequent delay. We hold ourselves responsible for all fees entrusted to our agency

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We have superior artists in our own office, and all facilities for producing fine and satisfactory illustrations of inventions and machinery, for newspaper, book, circular and other printed illustrations, and are always ready to assist patrons in bringing their valuable discoveries into practical and profitable use.

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United States and Foreign Patent Agents, publishers Mining and Scientific Press and the Pacific Rural Press, 224 Sansome St., S. F.

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

California Acclimatizing Society—Location of principal place of business, San Francisco, Cal. Notice is hereby given, that at a meeting of the Board of Directors, held on the 11th day of February, 1876, an assessment of fifty cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold and silver coin, to the Secretary, at the office of the company, room No. 37, Nevada block, northwest corner of Pine and Montgomery streets, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the fourteenth day of December, 1876, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the third day of April, 1876, to pay the delinquent assessment, together with costs of advertising and expenses of sale. W. W. TRAYLOR, Secretary, pro tem. Office, room 37, Nevada block, San Francisco, Cal.

Cherokee Flat Blue Gravel Company—Location of principal place of business, San Francisco, Cal. Location of works, Cherokee Flat, Butte county, Cal.

Notice.—There are delinquent upon the following stock on account of assessment (No. 35) levied on the twenty-eighth day of December, 1875, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
O. Weller	1	624	\$31 20
Louis Schmidt	8	128	6 40
E. J. Pfeiffer	10	480	24 00
A. Cassell	17	4,008	230 40
Mrs. E. M. Walton	21	128	6 40
Mrs. Mary W. Farrington	35	144	7 20
Geo. W. Bamage	36	320	16 00

And in accordance with law, and an order of the Board of Directors, made on the twenty-eighth day of December, 1875, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the office of the company, room 13, No. 328 Montgomery street, San Francisco, Cal., on the nineteenth day of February, 1876, at the hour of one o'clock, p. m., of such day, to pay delinquent assessment thereon, together with costs of advertising and expenses of the sale.

O. H. BOGART, Secretary

The Henry Tunnel.

A letter was received here a few days ago from Major Henry, who was then in New York city, stating that he had succeeded in forming his tunnel company, and that a Burleigh drill had been purchased and would arrive here in about 30 days. Our readers will remember that immediately after the departure of Major Henry for the East, we published an article stating that it was his intention to run a tunnel through Treasure hill, and it now looks like he has made the necessary arrangements in the East for carrying out his original plans. We hope it may all prove true, for in the tunneling of Treasure hill depends much the future prosperity of Hamilton and its surroundings. We copy the following from an article we published some time ago, setting forth the plan of operations and benefits to be derived therefrom: "At length we have the promise of having the hidden treasures of Treasure hill exposed to view. Major Henry, with the eye of an engineer, conscious of the great profit resulting from the successful carrying out of the indicated enterprise, has, after the needful surveys, located a 3,000 foot tunnel that, when carried out, will under run the mountain crest some 1,600 feet, and will perfectly expose the three formations that compose it. These rocks are all metalliferous, of the silurian age, with their character fully developed to the depth of 2,100 feet, in this and Cognate districts. First, limestone; second, a shaly slate; and finally a quartzite, the home of fertile ores in Pioche and Cherry creek, that may extend far beyond the 2,100 feet at which it has been recognized. The large amounts of treasure obtained by superficial working are a reliable index of the vast wealth to be derived from exploitation, and it is more than presumptive that Major Henry and his friends, though with no franchise save that bestowed by general law, will in both profit and honor outvie Sutor and his far-famed and much contested works. The projected tunnel will traverse comparatively virgin ground, concurrently with east and west lodes of known wealth, and will currently cut at right angles a number of north and south veins at a profound depth. The Aurora lode, the most conspicuous of this class, will be intercepted at about 1,200 feet in depth, in the quartzite country, and this, with Captain Drake's incline, now down over 600 feet, will be a complete illustration of this remarkable lode. Within a year, at an unimportant cost, and independent of the season, with the appliance of a Burleigh drill, this work can be consummated to the great profit of its operators, and it is highly probable that immediately the current expenses will be defrayed or materially lessened by the extraction of ores from the constantly recurring veins. Major Henry's success in organizing an effective company would be welcomed by our community, that would individually or collectively warrant its future.—*White Pine News.*

Mining at Columbia Hill.

The Nevada Transcript says: The Enreka Lake company, at Columbia Hill, commenced the construction of a long flume from a point on Spring creek near the road crossing leading by Hntler's to Priggin's mill, under the immediate supervision of A. H. Brigham, their efficient and energetic foreman, about one year ago. It is now completed over a mile in length. This property is known as the Consolidated flume, and is intended to wash all the aniferous gravel deposit extending from Cherokee to the backbone house and Lake City, and including all the old town site of Columbia Hill. This flume is one of the largest structures of the kind to be found in this part of the State, it being eight feet wide, five and three-eighths inches to 14 feet, requiring over 400,000 feet of 10-inch blocks to line it, although a portion is lined with rocks, which seem to run as well as the blocked portion. There were many miners who doubted the propriety of constructing a flume of such immense capacity on such a light grade; but this demonstrates the practicability of running this light sandy deposit on a light grade and with a comparatively small head of water, they only using from 1,500 to 2,000 inches, which moves a much larger quantity than was ever supposed. They are now washing a large portion of the deposit of tailings run from top ground into the ravine adjoining the side hill, which they are now sweeping into this enormous gateway for tailings. They now have a bank of 80 to 100 feet, which grows deeper and deeper as they continue into the hill, reaching to the depth of 250 feet above grade, before they get to the back of the ground. This mine covers an area of over 1,000 acres of ground, which it is estimated will take from 10 to 15 years to run off with the most approved appliances and machinery for working these immense deposits. This company is using 22 to 34-inch iron pipe, with a pressure of 150 feet, to which can be added, when necessary, 150 feet more, giving 300 feet pressure. They are also using one of Hoskins' largest size hydraulic giants, with an eight-inch nozzle. This is the largest one of these machines ever made. This machine, under the present pressure of 150 feet, will throw a stream of water through the eight-inch nozzle the distance of 350 feet, cutting the bank and rolling over and hoisting large stumps in the air like a boy would his bounding ball. It discharges from its present position 1,200 inches of water. The great quantity discharged will give the reader an idea of the tremendous power and force it has on any object that may come in its way.

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For hard and wet Rock, Iron, Copper, etc., and Submarine Blasting.

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Are prepared to make SHEET IRON AND ASPHALTUM PIPE, of any size and for any pressure, and contract to lay the same where wanted, guaranteeing a perfect working pipe with the least amount of material.

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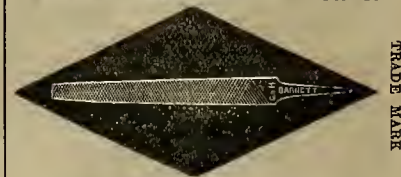
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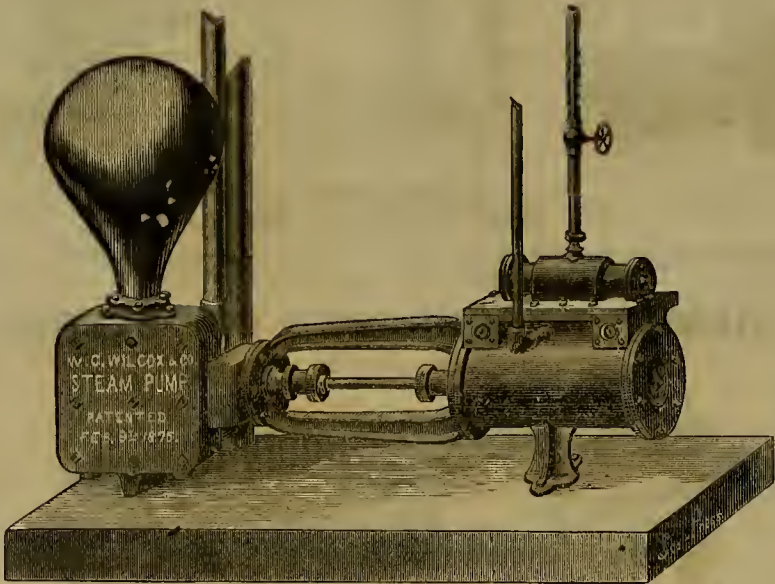
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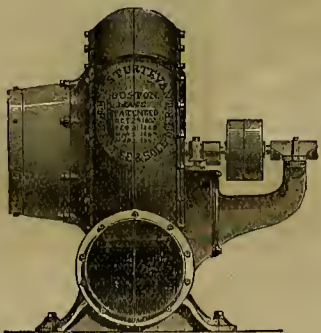
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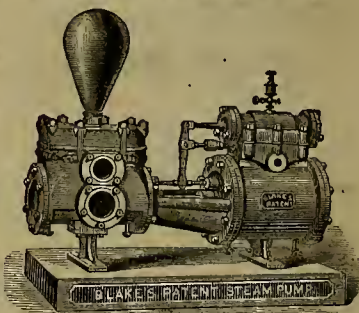
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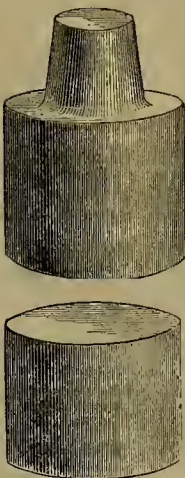
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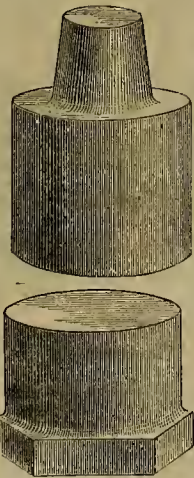


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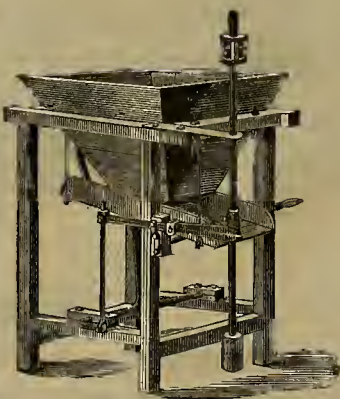
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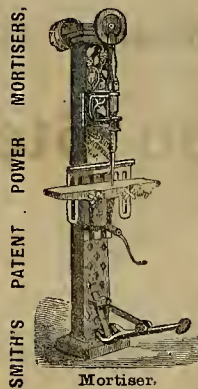
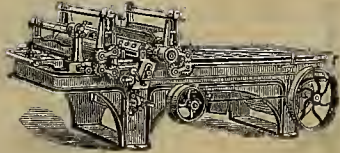
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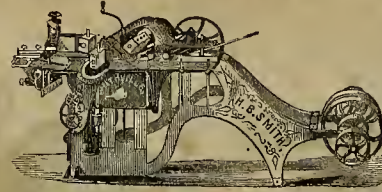
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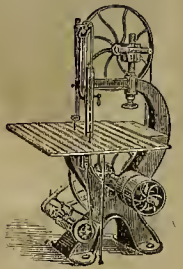
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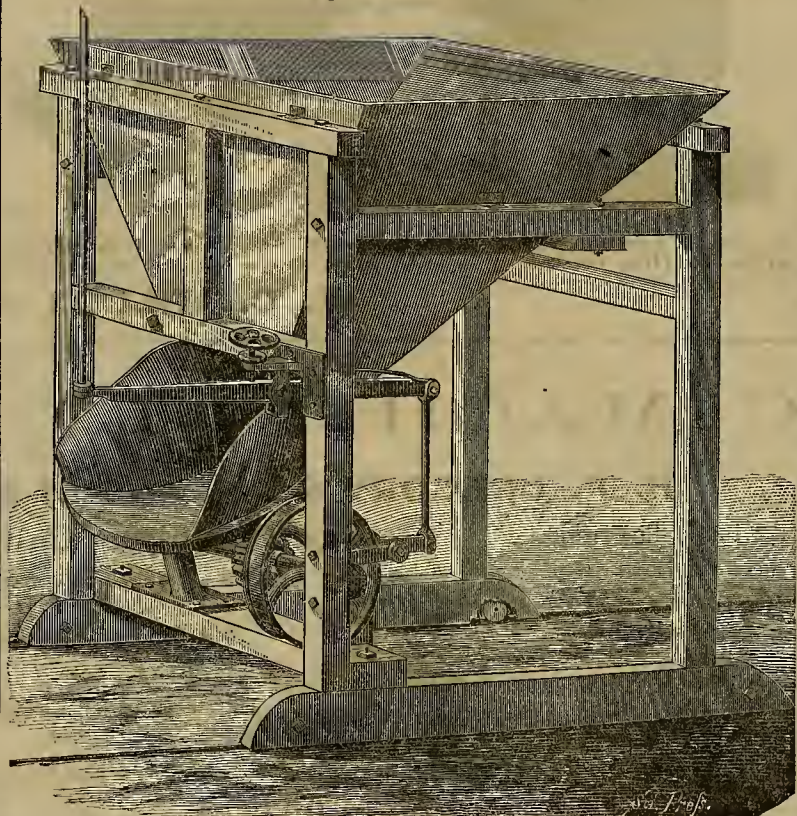
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SAN FRANCISCO, SATURDAY, FEBRUARY, 19, 1876.

VOLUME XXXII
Number 8.

The Father of His Country.

Before another issue of the Press lies before the reader the Centennial year's anniversary of Washington's birth will have been celebrated with a spirit beyond that which the 22d of February has elicited during recent years. It is only natural that the Centennial year should awaken in us renewed appreciation of all the events which in any way contributed to the results we celebrate.

It is fitting that the birthday of Washington should be greeted this year with genuine thanksgiving. We care not whether the patriot impulse express itself in poem or oration; in noise of the salute or the harmony of anthems; in the measured pomp of the parade or the graceful variety of social reunion—each and all of these, if the spirit be right, may recall the debt of gratitude the nation owes to the father of his country.

History has formed its sober judgment of the character of Washington, and its own features can but illy conceal an expression of enthusiasm at the contemplation of his glorious deeds gloriously achieved. Oratory has adorned its roundest periods with his high sounding name. Patriotism has kindled in a world of hearts and nations have gained new life and liberties with the watchword taught the world by Washington. It would be idle to recite the glories of his life. The world knows them. Every language of civilization speaks his praise. Every generation of men will early learn his beneficent accomplishments, so long as eloquent words are expressive of noble thoughts.

But there are a few avenues through which it may be of vital value to-day to draw light from a memory of Washington. It matters not though the light dazzle eyes which have grown accustomed to the darkness begotten of the events of recent years. It may expand the contracted pupil with which the national eye has learned to look upon truth, virtue and disinterested patriotism to let a bright, sharp flash of early nobility and manhood pierce it. It may awaken the sluggish national conscience, seared by a blast of revelation of every grade of evil doing, in public and in private station, to contemplate a life of disinterested goodness, of parity and of truth.

It is difficult to go back to the time of Washington. Let us bring Washington to our own. What do we see? Shall we call him Washington-Tweed, plundering a metropolis and buying legislators hand and soul? Shall we call him Credit Mobilier Washington, convert a national enterprise into a scheme for robbery? Shall we call him the Washington of Rings, encircling a nation and leading those nearest to the chief-magistrate into deeds meriting criminal indictments? Or shall we call him the Washington of Corporations and Monopolies, paralyzing the industries of the country by despotic exactions and making the springs of wealth and prosperity tributary to powers ostensibly arranged to be their servants? Shall we call our politicians by the name of Washington? Washington buying a majority of a legislature that he may be a Senator! Washington enchainning the conscience of the civil service of the nation with the alternate of support or surrender! Shall we call our spiritual and moral leaders Washington, when the highest of them cannot clear his skirts, even with all the appliances of modern justice? Shall we call our private citizens Washingtons, when the air is filled with the reports of embrozzlements, defalcations and crimes?

It is not a pleasant contrast which is afforded by holding the honored name close to the plentiful instances of present dishonor. But it is well to make the contrast, nevertheless. As we approach the thickest darkness the light brighter shines. Perhaps we could not honor our hero better than to note that thus, after a century's existence of the nation he founded, his name shines so like a star upon the night of our ill doing. But a star is a double symbol. It recalls the light which has departed and it heralds the light which is approaching. Thus let the memory of Washington be our star on this Centennial year. Let it usher in the day which shall rival the light which attended his uprising. As by his arm and councils he freed a nation from the power of kingly oppression,

so now let his memory lead us through this era of official corruption and social demoralization. Thus will his deeds live after him. Thus will arise a generation fitter to maintain his fame and speak his praises.

An English Journal on the Hayden Survey.

We have had occasion to make liberal extracts from Prof. Hayden's report of his

noticing the list of publications of the United States Geological Survey under the direction of Professor Hayden, testifies in a very flattering manner to the value of the work:

"We feel it our duty to call attention to the truly magnificent character of the survey now being executed on behalf of the Government of the United States. Not merely the geology, but the mineralogy, botany, zoology, meteorology, ethnology and antiquities of the whole

Vertical Wood Boring Machine.

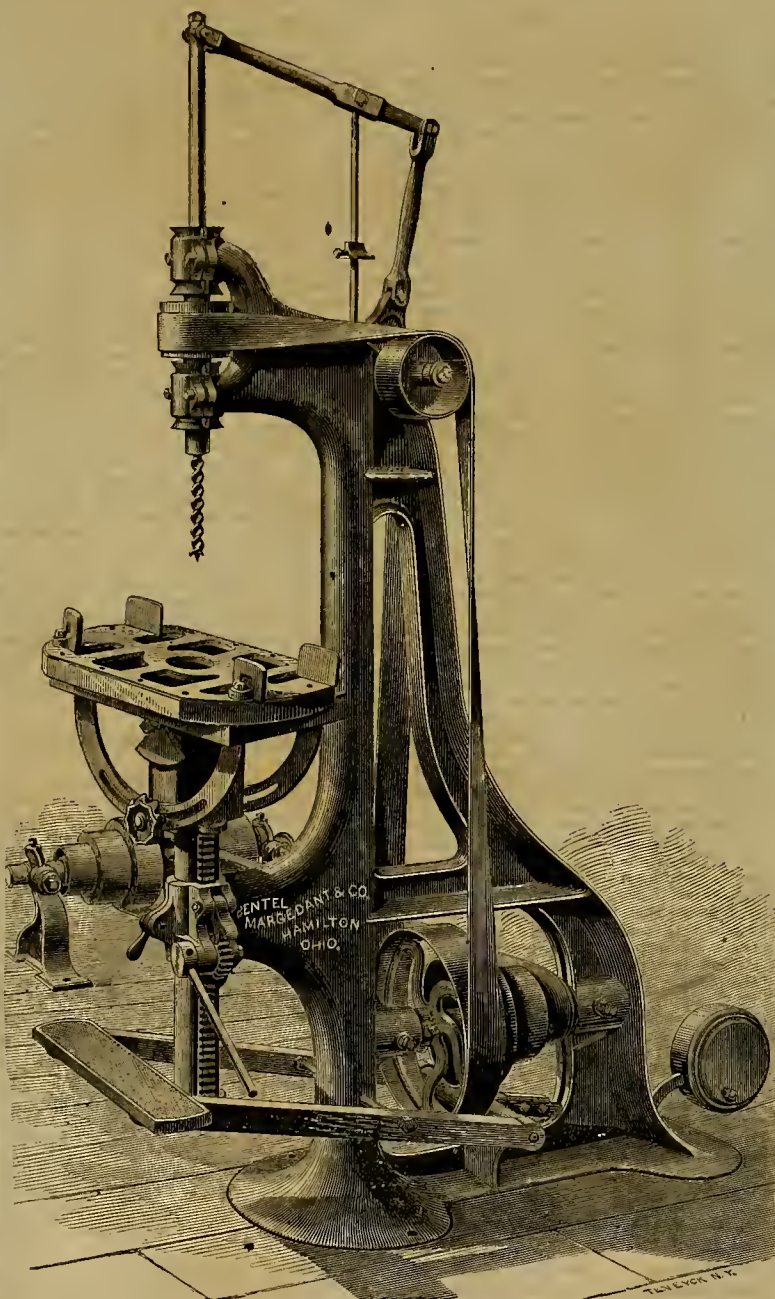
We give on this page an illustration of an improved vertical wood boring machine, manufactured by Bentel, Margadant & Co., of Hamilton, Ohio. The machine has a frame strongly constructed of a hollow column, heavily braced by I-shaped web ribs, and a broad base, well calculated to resist jarring and trembling. The table is also strongly made, and is adjustable to any angle or position. It can be raised and lowered by means of a rack and pinion, turned on its axis, and can be tightened at any length by a simple turn of the handle, which closes a long split bearing. The table proper can be inclined at different angles, and the upper part may be moved out or in, revolved, and adjusted. A cone pulley of three steps enables the operator to run the machine at three different speeds, for large, medium or small sized machine augers. It has a commodious self-returning treadle, which requires very little power to bring the auger bits to the necessary depth.

Holes can be bored at any angle, from one-eighth of an inch to three inches diameter, and from one-quarter of an inch to 12 inches depth. An adjusting stop on the connecting rod gauges the depth of the hole. The rests on the table can be adjusted for straight, square, oval, circular and bent work. The idler pulleys (which are frequently a source of trouble in such machines) do not need re-adjusting for different heights of the countershaft from the machine. The manufacturers direct special attention to the facility with which a number of holes, with variations of angle, can be accurately bored. In the slots of the radius brace one or two stops can be inserted in such a way that the table can be swiveled from a horizontal plane to either side; and, as the table slides forward and backward, and can be turned on its axis, it is obvious that, in a piece of timber, a number of holes can be bored which differ in angle and place, without moving the work about. The machine is adapted for boring short as well as long pieces of material, and will do the work, it is claimed, with great ease and rapidity. The countershaft with cone pulley, as shown in the engraving, may be set on the same floor with the machine, or attached to the ceiling, so that the belt may pass from either side, in an inclined direction or perpendicularly. The tight and loose pulleys are of nine inches diameter, three and a half inch face, and should make 250 revolutions per minute.

THE AMAZON AND GLASGOW MINES.—New machinery for the Amazon and Glasgow mines has been ordered by telegraph, and within ten days it will be upon the ground, consisting of a fine eight-inch Blake pump, boiler, etc. A full force of men are employed in grading for the foundation and enlarging the size of the main building to meet the requirements of increased motive power. The body of water recently struck comes principally from the north drift, where the vein widened very perceptibly and up to the last work done was daily improving in appearance. On the evening of the 8th, the water had increased so that all underground working had to be suspended, the small donkey engine being unable to keep it down. The company do not by any means feel discouraged at this; on the contrary, they deem this unusual flow of water a good indication that the large vein from which it comes contains a larger percentage of precious metals than before shown, and when the new pumping machinery is in place and at work we hope their expectations may be realized.—*Lyon County Times*.

A NEW LEAD DISCOVERED.—J. C. Harris and J. C. Phillips discovered a new lead in Winnemucca mountain this week which promises to be valuable. The croppings assay \$87 per ton in silver, and are three feet wide. The discoverers have located 1,500 feet of the ledge in accordance with the United States mining laws.—*Silver State*.

NEW STRIKE.—Intelligence has just reached us that a rich and extensive strike has been made in the third level of the Paymaster mine at Ward district. We understand that it is the first ore that has been found in that particular locality of the mine. The Paymaster is getting to be a "way up" mine.—*White Pine News*.



VERTICAL WOOD-BORING MACHINE.

surveys through Colorado and adjoining Territories, and we have reason to believe that the interesting descriptions and graphic engravings of the wonderful scenery of that section of the country, while they have served to embellish the pages of the Press, have been well received by our readers. We are glad to know that the labors of the Professor are appreciated abroad as well as at home. In the January number of the *Quarterly Journal of Science*, published in London, and edited by Professor William Crookes, F. R. S., the editor, after

Union are being carefully explored. Will the day never come when a similar survey will be made of the still wider and more varied regions included within the British Empire? It would be a glorious contribution to science and a worthy bequest to posterity."

In the western portion of Placer county roses are blooming, wild flowers appearing on the plains, oranges ripening and grain a foot high, while in the middle and eastern end the snow is from 10 to 30 feet deep, and the mercury frequently drops below zero.

CORRESPONDENCE.

More About Straw Burning Engines.

EDITORS PRESS:—I was considerably interested and amused by reading an article in your last issue, having the above title, and signed J. W. Riley. This gentleman appears to thoroughly understand his subject, in so far at least as his own observations have gone; beyond that, and what may be doing in other parts of the State in regard to this species of industry, we are left in blank.

But if you will allow me, Sirs, I will add a few supplementary remarks to Mr. Riley's article, which may not be altogether out of place, or displeasing to the parties mentioned. We shall all agree in saying that all honor is due Mr. Rice for the energetic measures that, in conjunction with others, he has taken to bring to a successful issue his idea of an engine that shall burn straw alone for fuel, and yet lose not one whit of its power or usefulness.

But we are naturally led to inquire, is Mr. Rice alone in the field, or are there others that deserve honorable mention at our hands? I think there are, and first and foremost among the claimants stands prominently forward the name of

Mr. Enwright, of San Jose.

It is nearly ten years ago, (if my memory of dates is correct,) since the idea occurred to Mr. Enwright that it would be just as feasible to use steam power with threshing machines as to use steam power in a sawmill, or elsewhere, and thus keep step with other parts of the world, where they were already in active operation; whereupon, without adequate means, without proper tools, with the whole voice of the community against him, does he at once set to work to build his engine. That it would never do, that it would set everything on fire, that farmers would never allow it inside their fences, that it would be the foolish fellow's ruin, of course every one agreed to, but in spite of all this, Mr. Enwright built his engine, and after a good deal of persuasion, a farmer allowed him to try it with his grain, the builder being responsible for the damage it might do.

The Result.

Of course is well known; horse-powers were at a discount at once, and those that had laughed the loudest, now were the wisest, who had always known it would prove a good thing. Since that time Mr. Enwright has built a large number of engines, which compare favorably with others, either imported or those of home manufacture. Of course they all burned wood. Within the last two years this enterprising gentleman has turned his attention to straw burning engines, and last year a number of them were doing very good work in the harvest field. As he drove out the horse-powers with his wood burning engines, so now he threatens to drive out their turn by his straw burners, and he is in a fair way to do it. For simplicity, durability and strength, I can safely say, from personal observation, that they are equal to anything of their kind that has ever gotten up steam in this State. The boiler has return flues, the straw being fed to the furnace by hand, without the intervention of any machinery whatever.

Brown Brothers of Salinas.

Then there is a firm of builders that has recently started at Salinas, in the manufacture of engines that are to burn straw. I refer to the Brown Bros. These gentlemen, within the last few years, left their home in Australia, and have settled down in this State, as offering the best advantages and the surest returns for capital invested of any country they have ever seen. They have bought extensive grounds at Salinas, and erected a large two-story building, where they mold their own castings and do their own work generally. Already they have built some eight or 10 straw burning engines, which have given eminent satisfaction; and so confident are they that ultimately they will be used to the exclusion of all others, that this year will witness another hatch of them turned out of their erecting shop, they being eagerly bought up by the farmers and others in their vicinity. A firm of

Santa Cruz Builders

Tried their maiden hand last year on this class of industry, and though not so successful as others, they will do better in the future and learn wisdom from past failures.

At Watsonville

We have Mr. McLean throwing open his large shop for our inspection, and although this gentleman has not built any of these engines as yet—contending himself with remodeling some and repairing others, yet it is the nucleus for much larger things in Pajaro valley in the immediate future; many others, too, in different parts of the State, are expending time and money in the same direction. Let a want once be felt and we may safely let our American genius alone for quickly supplying that want.

Mr. Riley informs us that an English firm has sent one of their straw burning engine to this coast. Of course we are very much obliged,

but California presents her best compliments to England, with many thanks, but thinks she can supply, through the means indicated, her own children in this direction for many years to come.

That in the construction of these engines there are difficulties to be encountered, of course no one questions, but that these difficulties will be eventually overcome no one doubts, and it is the truest wisdom to frankly acknowledge them, and set about their remedy, rather than gloss them over, and assert that everything runs smooth—that there is nothing left to be further desired. Of course there is an enormous pile of straw burned during a day's run, and that in its turn must make an enormous quantity of clinkers and cinders, and how most readily to get rid of these is one of the difficult problems that our engineers are required to solve. The burnt straw is naturally light and feathery, and the strong draft sucks up these particles against the flue sheet, but being too long for most of it to pass through the flues, it commences to form a compact mass over their mouths, and very shortly the whole flue sheet will be completely covered with a mass of stuff two or three inches thick, thereby stopping all draft until it is removed, sometimes causing considerable inconvenience. That this and other obstacles can be removed I am quite confident of, and that too in a very simple manner, but the modus operandi I must leave until next time.

C. Z. SANDERS.

San Francisco, Feb. 10th, 1876.

Placer Mines in Kern County.

The *Stock Report* gives a brilliant account of the new placer mines being opened out on the Kern river. In a late issue it says:

We were fortunate enough yesterday to enjoy a long conversation with a mining engineer of experience, who has just returned from that section, and who speaks most flatteringly of the prospects of the new placer mines. He showed us the results of some dozen or more pans which he had washed, varying from about 10 cents to a dollar according to the depth from which they were taken, but in no case, not even in that of a pan washed from the very grass roots, failing to show a color. Of course nearer the bedrock it is very much richer. From the conversation of this gentleman we gathered a good idea of the extent of the auriferous deposit. The company owns a large quantity of land extending from the mountains down to the river bank, 250 acres of which is known to consist of rich gravel. Of this much lies in the old river bed, which is 150 yards wide and from 20 to 30 yards deep. This presents the most favorable possible condition for hydraulic mining, as the gravel is exceptionally clean, the bedrock hard granite, worn into a trough-like shape by the former action of water, and there is a complete immunity from all unfavorable conditions, such as clay or cement in the gravel, tree stumps or large boulders. There will therefore be no waste of gold, and all that the gravel contains can be taken out. Setting the yield at the lowest figure—50 cents per cubic yard—we have a gross yield of \$50,000 per acre, and 75 such acres give a total yield of \$3,750,000, which must be acknowledged to be very comfortable and satisfying figures. The cost to work the ground may be estimated at one cent per yard, or \$1,000 per acre, leaving the satisfactory net product for 75 acres of \$3,675,000, and the probable contents of the entire auriferous portion may be proximately stated at \$6,000,000. The washing capacity of the water supply will be about 7,000 yards, or \$3-750 per day, at the cost of little more than \$50. In the above estimate the value of the ground is taken at an average of 50 cents per yard for perfect safety, but prospecting shows it to yield all the way from 50 cents to \$150 per cubic yard, according to distance from the bedrock. The gravel being all water deposit, is evenly distributed that its value at different depths can be very readily calculated from a few prospects, and owing to the favorable nature of the ground the expenses of working can be as easily computed. The principal outlay will be the water supply, which has to be brought a distance of about 10 miles. The ditch is at present in process of construction, and half its distance will be flume construction, requiring about 800,000 feet of lumber. The entire expense of bringing in water, the supply of which will last the year round, and of opening the ground, will be about \$50,000. The company is now fully organized and work will be pushed forward briskly.

THE PHENICIAN BONANZA.—George F. Dinsmore, of this city, sent a small lot of rock from the Phenician lode, Barker Hill district, to Joseph Barnett, at Salt Lake, who is a joint owner in the mine. Mr. Barnett had an assay made of the ore, the certificate of which was received in this city this morning. Following is the result: Silver per ton, \$2,119.26; gold per ton, \$301.46; total assay value, \$2,420.72 per ton. This mine is situated about 35 miles south of Anetin, and has lain unworked for some time owing to the remoteness of its location, but it has long been known as a valuable property. The existence of such mines as this in our immediate vicinity, yet too far distant from the railroad to admit of cheap working, is a strong argument in favor of the speedy construction of the Austin and Battle Mountain railroad, the completion of which would be the means of opening up a large number of such bonanzas as the Phenician. —Austin Reville.

Motive Power for the Centennial.

The monster engines to furnish motive power for the Centennial Exposition are being erected in Machinery hall. They were built at Providence, R. I., under a contract made with Geo. H. Corliss, of that city. The engines are what is known as "beam engines" of the Corliss pattern, with all the latest improvements, and nominally of 700 horse-power each, or 1,500 horse-power in both, though this can be increased even to 2,500 horse-power should occasion require. The cylinders are 40 inches in diameter, with 10 feet stroke. The engines are provided with air pumps and condensing apparatus, and are intended to work with 25 to 30 pounds of steam, according to the requirements of the exhibition.

The gear fly wheel is 30 feet in diameter, two feet across its face, and when completed will weigh 56 tons. And as one looks on it at the works, it is easy to believe that it is the heaviest cast wheel ever made, as indeed it is. It has 216 teeth, and these are to be finished with such degree of accuracy, such perfection of nicety, that though the wheel is to make 36 revolutions per minute, it is confidently expected it will run noiselessly. The crank shaft is 19 inches in diameter and 12 feet long, of best hammered iron. The "bearings" for this shaft are 18 inches in diameter, 27 inches in length. The cranks which, seen alone, seem to be enormous, are of gun metal, highly polished, and weigh over five tons each. The walking beams are of new design, and are nine feet wide in the center, 27 feet long, and weigh 11 tons each. These are cast solid, while the gear fly wheel is cast in sections. The connecting rods are about 24 feet long, and are made of horse shoes, or to be literally correct, of horse shoe scrap iron, that being considered the best iron that can be obtained. About 9,600 horse shoes were used in making the connecting rods. The piston rods are of steel, 6½ inches in diameter, and the velocity of the pistons will be 720 feet per minute. The large gear with which the gear fly wheel connects is 10 feet in diameter, and is a solid casting weighing 17,000 pounds. The height of the engine from the main floor to the top of the walking beam at its highest pitch will be 39 feet, and every part of it will be accessible by means of iron staircases and balconies, which are so designed as to contribute largely to the embellishment of the whole. The weight of the engine and everything connected with it is 700 tons. The engine will be placed in the transept, in the center of the hall, directly facing the main side entrance. The building here is 70 feet from the floor to the top of the ventilator, thus giving ample height for the working of the engine. The gear fly wheel will connect, underneath the floor, with the main shaft, which will be 252 feet long and run cross-wise of the building. The main belts, instead of being an eye-sore and in the way, as is too often the case, will pass through the hall in out-of-the-way places, and be enclosed in glass apartments 8½ feet in size, so as to make a proper exhibit of the belts.

The boiler house is now being erected a short distance from the transept and 36 feet from the main building. In this there will be 20 of the Corliss upright boilers, of 70 horse-power each, connecting with the engines by means of pipes underneath the floor 320 feet long and 18 inches in diameter, of wrought iron double riveted.

Consolidated Virginia Dividends.

Stockholders in the Consolidated Virginia mining company received their usual dividend of \$10 per share last week. The company first commenced paying dividends in May, 1874, at the rate of \$3 per share. In March, 1875, the dividends were increased to \$10 per share, and this is the twelfth consecutive dividend of that amount that has been paid. Following is a list of these monthly disbursements:

Per Share.	Amount.
May, 1874.....	\$3
June.....	3
July.....	3
August.....	3
September.....	3
October.....	3
November.....	3
December.....	3
January, 1875.....	3
February.....	3
March.....	10
April.....	10
May.....	10
June.....	10
July.....	10
August.....	10
September.....	10
October.....	10
November.....	10
December.....	10
January, 1876.....	10
February.....	10
Totals.....	\$150

As the dividends represent 50 per cent. of the yield, it follows that the product of the mine for the last 22 months has been upwards of \$30,000,000. The monthly yield now is close upon \$2,000,000, and unless some adverse circumstances should occur, will be maintained at that figure throughout the remainder of the year.

QUICKSILVER.—The bad condition of the roads has so interfered with the shipments of quicksilver from the Redington mine that about 1,000 flasks, a month's production, has now accumulated. During ten months of last year the mine yielded 8,080 flasks of quicksilver, the bulk of which passed into the hands of Flood & O'Brien under contract.

From the Julian District.

A correspondent of the San Diego *World* writes from Julian as follows:

Along the mineral belt diverging toward Banner are the Ella mines, owned and being worked by John Murray, Atkinson & Co., the Kentuck, owned by and under the supervision of Messrs. Bailey & Brawley, the Madden being worked under a lease by Cooper, Clyde & Co. Each of these mines are taking out first class ore. These mines, in days past, turned out many thousands of dollars, and must ultimately develop into rich and extensive mines.

Still further east are the Ready Relief and Hubbard mines, the former owned by Neyhart & Co., the latter by Messrs. Woodruff, Thurman and others, both being on the same veins and adjoining each other. These mines have an inexhaustible body of ore to take out.

The Ready Relief company have a fine 10-stamp mill on the mine which is kept busy. The Hubbard company are erecting a mill on their mine, so I am reliably informed.

The developments made in the Helvetia and Tom Scott mines, which has demonstrated beyond question that the mines at Julian are not only extensive and permanent, but increase both in size and richness as they acquire depth, has stimulated the owners of numerous other mines which have, for the past two or three years, been lying in a state of suspension, to resume work, and there is at the present time more work being done on this class of mines, and prospecting for others, than at any time previous in the history of the district; and it is the opinion of your correspondent that these efforts will result in the development of some first class mines.

New Mining District.

A correspondent of the Winnemucca (Nevada) *Silver State*, writes from Oresana concerning a new mining district as follows: Some mines were discovered near here some time since, which are likely to prove of considerable importance. The discovery in question was accidentally made last October by John O'Kane of Big Meadows, while hunting horses in the extreme southern end of Antelope mountains. Shortly afterwards O'Kane, J. B. Brown and M. Guerin went to prospect the find, and while doing so discovered several veins of carbonate and galena ores. The former assay from \$100 to \$260, and the latter from \$200 to \$500 per ton in silver. The veins run parallel with each other and are from 20 to 40 feet apart. The first or most eastern vein of the series divides a granite from a slate formation and all of them dip east. A good many locations have been made, but, as Methodist ministers say at revivals, there is room for more, and an inviting field is open to prospectors. The owners are now going to work to develop these mines to some extent, and have now on the ground everything ready for a starter. Several mining experts have visited the district lately and all seemed to be favorably impressed with the prospect. Some parties offered to bond the mines for \$29,000, but the owners prefer prospecting them until their extent and probable value is more fully ascertained. These mines are located near San Jacinto district, eight miles southwest from the Humboldt house on the Central Pacific railroad.

MANUFACTURE OF METALLIC LIFEBOATS.—A new industry has been inaugurated in San Francisco. The well known machinist, Mr. J. F. Penny, is now engaged in building four metallic lifeboats for one of the Goodhall, Nelson & Perkins steamers. Two of them are 26 feet long. The larger ones are 28 feet long, with a breadth of eight feet, and a depth of three feet three inches, and are capable of carrying 50 or 60 persons in a heavy sea. The gunwales, benches, stern post, stem, keel, etc., are of angle pine, Oregon pine and Eastern oak. Fore and aft are large air-tight compartments. The bottoms are of galvanized iron an eighth of an inch thick, brought from Pittsburg. It is believed that this is the only metallic lifeboat factory anywhere along the Pacific shores of the continent. It is much cheaper to bring the iron overland by rail than it is to purchase the boats at New York and have them shipped either by rail or steamer. They make no widdy freight, and rough handling damages them. This being the case, no reason exists why a great industry of this character might not be gradually built up at a port like San Francisco, where ships from every quarter of the globe are constantly arriving and departing.

RESPONSIBILITY FOR NOT RUNNING TRAINS ON TIME.—The responsibility of railway companies for damages arising from not keeping time with trains according to published time hills, has been settled in England by a decision rendered by a London superior court in a recent case. A Mr. LeBlanc sued the London and Northwestern railway company for the cost of a special train from Leeds to Scarborough, which the plaintiff had ordered in consequence of his being brought from Liverpool to Leeds too late for the ordinary train from Leeds to Scarborough. The case came up in a county court, and was decided in favor of the plaintiff, the judge ordering the London and Northwestern company to pay the costs of the special train. The railway company appealed in the case to the superior court, where the points raised were argued by able counsel. The decision of the lower court was affirmed.

SULPHUR MINE SOLD.—Theodore Hale has sold his sulphur mine at Inferno to parties in this city.

MECHANICAL PROGRESS.

Combined Iron and Steel—New and Important Invention.

The uniting of iron and steel by welding is nothing new. It has long been more or less perfectly done by the use of various fluxes, but when well done it has been at the expense of much labor and cost. To illustrate this we need but instance the outfitting of a boot and shoe manufacturers, etc. These are made by welding, a few inches at a time, a narrow strip of steel on to one side of an iron bar, by the tedious process of a forge fire and hand hammer. The billet thus prepared is heated to a "cherry red" and drawn down to a thin band about two inches wide. This operation is costly and the product correspondingly high in price, bringing several hundred dollars per ton more than cast steel. The combination of the metals in this manner is not only costly and laborious but circumscribed within very narrow limits.

Efforts were also made a few years since to weld steel tops to iron rails by means of powerful rolling machinery, but so loosely was the steel held to the iron that the two metals soon separated and became quite as dangerous as the primitive plate rail which so often turned up as a "snake's head" and went crashing through the cars to the almost sure destruction of life. But we now hear of a

New Mode of Welding Steel to Iron. Recently invented by Mr. Eldridge Wheeler, of Philadelphia, which promises to effect quite a revolution in the economical and effective mode of the process. The merits of the invention are undoubtedly large, and command themselves at once to the intelligent mechanic and engineer.

Our own government has recognized its value, and the Chief of Ordnances at Washington has been appointed to give this matter a thorough investigation. Bismarck, who has already been informed with regard to it, has detailed one of his most experienced engineers to visit Philadelphia for a similar purpose.

The principle of this process rests in the fact that the only practicable way to make a business of uniting iron and steel is to bring them to a welding heat in one "pile" and simultaneously, and to then manipulate them by rotary motion. The difficulty which has hitherto been considered insurmountable, is that steel exposed to the high temperature requisite to bring iron to a welding heat is "burnt" or essentially injured. "Fluxes" but imperfectly and impartially obviate this, and beside the uncertainty of result, their use involves in large works a tediousness and difficulty of operation utterly incompatible with economy.

By this process a combination between steel and iron is as easily effected as between iron and iron by the ordinary method, and indeed with the same appliances, by the simple means of entirely and completely protecting the steel with iron from the oxidizing and decarburizing effects of excessive heat. In short, the steel is put into an iron case made as nearly air-tight as possible, and thus enclosed it is no more liable to be injured or "burnt" than is steel when melted in a black lead crucible.

Artillery officers who have examined this new invention are enthusiastic over it, for the great benefit that will be derived therefrom in the more thorough construction of cannons. Small arms will also receive an almost equal advantage, as both may now be practically steel lined within the bore. It is also equally applicable to wagon tires and car wheels, and to axles. In fact there is no combination of the two metals which cannot be more easily and accurately effected by this than by the old process, while its applications are so many, and of such value, that it would be impossible to give a full and intelligent summary of them with our limited space.

A cotemporary sums them up, under three heads, as follows: First, the reduction of steel into an iron-coated steel plate, or bar, in which case steel preponderates; second, the production of steel-centered iron, where iron is the principal metal used; and third, combination proper, in which the steel is so proportioned and placed as to endure wear and support strain. An important feature of this invention is that scrap steel of any kind, Bessemer rail ends, etc., can be utilized. Being "piled" as required and enclosed in an iron crucible, the steel, protected by the iron, can be heated to a semi-molten state, and when softened the weld to itself and to the surrounding iron is positive. No steam hammer is required to work the mass, but its reduction to any particular shape desired is effected with ordinary rolls, and with the same facility and speed as a pile of iron.

This iron-coated steel is especially adapted to subsequent forging, as the thin shell of iron continues to effectually protect the steel from injury by heat, and in the finished article made therefrom, as a horse shoe, the steel can be hardened without danger in use, the iron coating preventing fracture. If desirable, the iron can be so proportioned as to be in the bar, plate, or sheet but an extremely thin coating, or even an almost imperceptible film, easily planed, turned, or ground off, leaving a smooth surface.

We shall make more full reference, next week, to the advantages which this invention possesses over all others in the manufacture of cannon and small arms.

Artificial Spiegeleisen.

A discovery of much importance to iron manufacturers has recently been made by Dr. Etheridge, which consists in the artificial production of spiegeleisen, one of the indispensable ingredients in the manufacture of Bessemer steel. Hitherto all the spiegeleisen used by our manufacturers has been imported either from Germany or England, because it was supposed that among all our minerals, the peculiar species composed of manganese and iron naturally combined, and called manganiferous iron ore, the technical name for which is "spathio iron ore," did not exist here. And very likely the peculiar combination, so plenty in Germany, Spain and other parts of Europe, does not exist here; but we have limitless quantities of both in a separate state, and Dr. Etheridge's valuable invention consists of a process by which the two can be combined and made even more effective than the natural ore. The essential ingredient in the spiegeleisen is the carbon, which, being liberated, unites with the iron to make steel. The principal feature in Dr. Etheridge's invention is the use of a closed chamber, in which to flux iron, carbon and manganese. The exceedingly great refractiveness of manganese is what has hitherto foiled all attempts to make spiegeleisen from the American ores in cupolas. Placed in a closed chamber, these three ingredients can be subjected to any degree of heat desired. When the fusion point of manganese is reached, the carbon, having no chance to escape through oxidation (because air is excluded), becomes incorporated with manganese and iron, and the result must be spiegeleisen. The kind of spiegeleisen produced can be made to vary as desired in its percentages of carbon and manganese. The latter forms five different chemical combinations with carbon, varying from five to 36 per cent. By taking advantage of this fact, steel makers can make their spiegeleisen so rich in carbon and manganese that it can be made to go four and even six times as far, bulk for bulk, as imported spiegeleisen.

It is estimated that \$100 per day can be saved to each Bessemer plant in the manipulation alone of this improved spiegeleisen. So much less bulk being required to be fluxed, this economy in fuel and manual labor will be prominently observant to steel makers.

The most important desideratum of this invention is the enabling American steel makers to manufacture their own spiegeleisen on their own grounds from the separate ingredients, thus freeing them from their abject dependence on foreign markets separated from them by 3,000 miles of water.

SOLID CASTINGS.—A method has been devised by an English inventor, by which, in the running of steel and other metals, in a molten state, into ingots or other molds, a much greater degree of solidity, and consequently of strength and endurance, is insured. In this production of ingots or castings by this means, an air-tight cover is fixed on the top of the mold, with an aperture for running the metal into the same, either through this cover or other convenient point; and connected with this cover is a tube or pipe, with stop valve communicating with a vacuum chamber. At the proper time the stop valve is opened, and a communication is established between the mold and the vacuum chamber, by which means the air in the mold and the vapor arising from the molten metal are instantly drawn away; or the mold and box are fixed in an air-tight chamber, and the air end vapor then withdrawn in the manner described. The vacuum may, in this arrangement, be established and maintained by an air pump or other ordinary; and the method is both effective and free from complication.

A NOVELTY IN STEEL MANUFACTURE.—Letters patent have been granted to Messrs. Thomas A. Freeston, steel works manager, and George Ellinor and John Harrison, chemists of Sheffield, England, for improvements in the manufacture of iron and steel. The patent is said to be a very valuable one, and has for its object the purification of iron and steel. The process consists in the use of certain materials or compounds for the removal and elimination of sulphur, phosphorus, antimony, arsenic and copper from iron and steel, whether in the crude or advanced stage of manufacture. The benefits obtained from the invention, among others, are the production of a greater amount of pure iron or steel from a given quantity of raw material. The making of a superior class of iron or steel out of cupolas or blast furnaces and shortening the present circuitous mode of making good steel for rails is claimed; and it is even alleged that tool steel may be made from the Bessemer material by means of this process. The precise nature of the materials or chemical compounds used to effect the purposes claimed by the inventors are, as a matter of course, a secret.

BESSEMER PROCESS DEVELOPMENTS.—In a review of the iron trade for 1874 Hupfeld remarks that in improvements in the manufacture of iron and steel, quantitative progress only has been made for the most part, the best example of which is in North America, where for instance, at the works of Troy, New York, and the Cambria iron works, Pennsylvania, an average of 40 to 45 charges is made in 24 hours, two converters producing close on 1,000,000 wt. a year. On the Continent and in England the old Austro-Swedish method of direct working from the blast furnace is much in vogue, with the intent to lower the cost of pro-

duction, and so make head against competition (Neuberg, Turrach, Hoft, Reschitz, Dortmund, Sraing, Crusot.) Steel works without blast furnaces of their own endeavor to reduce the expense of re-melting by working up scrap with pig, at a high temperature. At Ternitz and Teplitz, in a combination of the Bessemer and Martin process, 60 per cent. of the charge is scrap. The scrap is thrown melted or cold into the converter with heated pig rich in silicon; with charcoal pig poor in silicon they are heated in the Martin furnace.—*English Mechanic.*

BESSEMER STEEL.—The success which is attending the attempts to substitute Bessemer for iron in many branches of manufacturing and construction, is full of promise for this industry. We have hardly done wondering at one achievement before we hear of another. Where the first rude and crude attempts to use it proved failures later experiments have proved successful. We have already informed our readers of the successful manufacture at Troy of horse shoes and nails from Bessemer. The shoes, it is claimed, are lighter and wear longer and more even than those of iron, while the cost is not much in excess of iron. The nails, it is asserted, can be driven through oak planks and clinched.

SCIENTIFIC PROGRESS.

Measuring Earthquakes on Mt. Vesuvius

The observatory at Mt. Vesuvius, presided over by Prof. Palmieri, is situated on a spur of rock on the side of the mountain, close to the Hermitage or half-way house. The delicate instruments used for registering the direction and force of earthquakes shocks are in the second story of the house, but are built on solid piers of stone reaching to the earth. The instrument for the automatic registration of vertical shocks is a fine metallic point, suspended by a coil of wire just over the surface of a cup of mercury. The slightest upward motion of the earth carries the mercury up to the wire, completing a galvanic circuit which instantly stops a clock and rings a bell to notify the observer to reset the apparatus and observe future phenomena. To measure the intensity of vertical shocks, small magnets are suspended over a cup of iron filings by means of coils of wire of different strengths. When a vertical shock occurs some of these magnets dip into the iron filings, and to one of these a light index is attached for measuring the intensity of the shock. For horizontal shocks the registering apparatus consists of U shaped glass tubes, partially filled with mercury, and set to the four cardinal points. A small weight rests on the mercury and is attached to a silk fiber, which runs over an ivory pulley and has a counterpoise at the other end. On each pulley there is an index and circular scale to mark the angle through which it turns. A horizontal shock causes the mercury to rise in the tubes or tubes corresponding to the direction from which it comes, the weight is raised and the pulley marks, by means of the index and the angle through which it has turned. At the same time the mercury in rising completes a galvanic circuit which stops a clock and rings a bell. The galvanic current from either registering apparatus also starts another clock, the pendulum of which has hitherto been held out of perpendicular, and this clock allows a roll of paper to be unwound, on which, by means of electricity, a pencil traces the movement of future shocks, the spaces between the markings indicating the time elapsing between the shocks. There is other apparatus in the observatory for measuring atmospheric electricity and for similar purposes, and presiding over all this delicate mechanism is Prof. Palmieri, who devotes all his time to the study of the great forces concentrated in his little world—Mt. Vesuvius.—*Philadelphia Ledger.*

A most interesting demonstration of the tremendous force of electricity was incidentally made in the course of an experiment upon a tube three-eighths of an inch exterior and one-eighth interior diameter, which could stand a pressure of at least 200 atmospheres to the square inch; this tube was fourteen inches long and bent at a right angle. A very large electric flash being sent through the tube it was split by the first discharge and the pieces thrown to a distance of several feet. The inner surface of the tube was, in fact, completely pulverized, so though it had been struck by a hammer. Mr. Reynolds estimates that the pressure must have been more than 1,000 atmospheres.

HOW ELECTRICITY SPLITS TREES.—The theory that the splitting of the trunks of trees by lightning is the result of the sudden evaporation of the liquids contained within them, has received much confirmation from experiments made by Osborn Reynolds, who succeeded in splitting small sticks of wood by passing the electric spark through them after they had been impregnated with water. He also burst small glass tubes which were filled with water, although the same tubes when empty allowed the electric spark to jump through them without in the least disturbing them.

IS IT THE ROQ?—Various accounts have lately been received of the appearance of an enormous rapacious bird in the interior of New Guinea, which has been called *Harpypopsis Nova Guinea*. May it not be the "roq" of the Arabian nights?

Sound Waves and Safety Lamps.

Twenty-two large explosions have taken place in English coal mines since the year 1866. Among these seventeen took place at the moment of the firing of a blast at a distance. Galloway conceived from this the suspicion that a violent sound waves might be capable of pushing the flame through the wire gauze of the safety lamp and thus ignite the inflammable gas around. It was known that when explosive gases are drawn through a wire gauze with a velocity of ten to twelve feet per second the flame penetrates and ignites them; but it was not known that a sound wave would do the same thing, and this is what Galloway has proved by experiment. He placed a safety lamp in an explosive mixture and fired a pistol at a distance of twenty feet, or ignited a box filled with a mixture of coal gas and oxygen. In either case a large flame was projected through the wire gauze out of the safety lamp and ignited the surrounding gas. He found no difference when the gas was separated from the air by means of a thin membrane, which would not permit air currents to pass, but only transmit the sound wave. This experiment was varied by transmitting the sound wave through a tube twenty feet long, and of which the axis was directed toward the safety lamp; closing this tube with an elastic membrane made no difference whatever. He therefore came to the conclusion that a blast in a coal mine may make all the safety lamps useless, while it explains the fact that an explosion in one part of a mine is often immediately followed by another explosion at a distant point.—*The Laboratory.*

CHEMICAL ACTION OF WATER ON IRON.—As an evidence that iron will not oxidize in pure water, take a piece of clear ice, melt it and heat to boiling; after boiling a short time, to free it of air, pour it into a small vial containing some pieces of bright iron wire. This vial must be quite full and tightly stoppered. Place a similar piece of wire in an open vessel and partially cover it with water. Set both vessels aside for a few days, when it will be found that the wire in the former is still bright, while that in the latter is rusted. This experiment shows that it is the oxygen of the air, and not that chemically combined to form water, which acts upon iron; moreover, experiment has shown that neither dry oxygen nor dry carbonic acid will attack iron. To produce the action of common oxidation upon iron the oxygen must be combined with nitrogen, as it exists in the atmosphere, and in all potable water.

MOTIVE POWER FROM ARTIFICIAL LIGHT.—We recently described at considerable length a mode of deriving motive power from sunlight. At a recent soiree of the President of the Royal Society, Dr. Crookes exhibited an extremely sensitive radiometer, with which he was enabled to perform the novel experiment of producing mechanical motion in vacuo through the agency of the rays proceeding from a candle flame at some distance from the apparatus. The following is a brief description of this ingenious device: It consists of a glass stem supporting a four-bladed windmill carrying four discs, one at each extremity of the four slender glass rays. These work horizontally and are supported by a steel point on a small topaz. The apparatus is placed in a small glass globe exhausted of air, and the radiations from the flame of an ordinary candle placed at some sufficient distance away is sufficient to cause it to rotate with great liveliness.

A PAYMENT ANIMALCULE.—Prof. Leidy, of the Academy of Natural Sciences, describes in recently published proceedings of that body a curious animalcule which he discovered on street pavements. It is named *gromia* and resembles a cream-colored ball about 1-16th of a line in diameter. When placed in water, it in a few minutes projects, in all directions, a most wonderful and intricate net. Along the threads of this net (which are less than 1-30,000th of an inch in diameter) float minute *navicular* from the neighborhood, like boats in the current of a stream, until, reaching the central mass, they are swallowed. Prof. Leidy states that during dry weather the creature remains quiet in the dust, and that when rain falls it spreads its net and gathers food.

SOUND MADE VISIBLE.—A sound writer, called an opescope, is a new invention. On the end of a two inch tube is pasted a piece of thin rubber or tissue paper. In the center of this is fastened a piece of looking glass, one-eighth of an inch square. Hold this end in the sun and the other end in the mouth, and sing or speak in it. The ray of light reflected from the mirror falling on a white surface describes curves and patterns differing for every pitch and intensity, while the conditions give uniform results.

In a chemical lamp, with a clean wick, be filled with a mixture of alcohol and glycerine, in equal proportions, it will burn until the last drop has been consumed, and with as useful a flame as if alcohol alone had been used. The wick must be carefully cleansed when the lamp is laid aside; otherwise it will become clogged and unfit for use.—*Engineering and Mining Journal.*

NEW MODE OF HARDENING SANDSTONE.—In Saxony, sandstone is soaked in a solution of alkaline silicates and of alumina. The liquid penetrates some inches into the stone, and renders the surface so hard that it resembles marble and will bear polishing. On being heated to a high degree, the surface vitrifies, and it may be colored at pleasure.

Sales at S. F. Stock Exchange.

Table with multiple columns listing stock sales for various companies like Alpha, Best & Belcher, etc., with prices and quantities.

Table with multiple columns listing stock sales for various companies like Golden Chariot, Best & Belcher, etc., with prices and quantities.

MINING SHAREHOLDERS' DIRECTORY.

Table with columns: Company, Location, No. Amt. Levied, Delinq't. Sale, Secretary, Place of Business. Lists various mining companies and their details.

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Table with columns: Company, Location, No. Amt. Levied, Delinq't. Sale, Secretary, Place of Business. Lists other companies not on the main boards.

MEETINGS TO BE HELD.

Table with columns: Name of Co., Location, Secretary, Office in S. F., Meeting, Date. Lists upcoming meetings for various companies.

LATEST DIVIDENDS (within three months)—MINING INCORPORATIONS.

Table with columns: Name of Co., Location, Secretary, Office in S. F., Amount, Payable. Lists recent dividends for mining companies.

The Mining Share Market.

As will be seen by our stock tables and lists of sales, the market for mining stocks continues very dull. Holders manifest a disposition to realize on very slight advances, and just at present no "big rise" is anticipated. The dividends declared this month are numerous, as will be seen by reference to our "Shareholders' Directory." California is expected to begin paying dividends in May, and then pay \$3 per share. There have been no special features of note to speak of in the market of late, the prices having been apparently fixed at about the same figures, with slight fluctuations. Several more companies are about to divide up their capital stock. The Yellow Jacket company have called a meeting for March 15th to consider and take action upon the proposition to increase the amount of the capital stock \$9,600,000, that is to say, from \$2,400,000, divided into 24,000 shares of \$100 each, to \$12,000,000, divided into 120,000 shares of \$100 each. The Knickerbocker company hold a meeting March 20th, to take into consideration and decide upon the proposition to increase the capital stock of said company from two million four hundred thousand dollars (\$2,400,000) to five million dollars (\$5,000,000), divided into twenty-four thousand (24,000) shares, of the par value of one hundred dollars per share, the present capital stock of said company, to ten million dollars, (\$10,000,000) to be divided into one hundred thousand (100,000) shares of the par value of one hundred dollars (\$100) per share. REPORT OF THE MARVELOUS RICHNESS OF THE BUNNELL MINE, near Kernville, have been followed by the news that the mine has been jumped by parties who are holding possession of it by force of arms. An expensive lawsuit, if not bloodshed, is the next thing expected.

BROWER.—Owing to an over-supply of ore in the dumps, the mine was shut down for a couple of days during the week, but was started up in full blast again this morning. The mills on the river have been bothered somewhat with ice for the week past, so that the amount of ore crushed will not be as great this month as last. There is no change in the ore breasts or the quality of the ore extracted. The prospecting drift south on the 1500-ft level is steadily advancing, but shows no change of value to report. The water still is being removed from the reservoir of work on the 1000-ft level. The air shaft is being extended downward toward the 1500-ft level. The hoist pit for the new powerful pump at the air shaft is completed. The first tank station of the shaft is also completed.

THE GOOD FRIDAY is looming up, and promises to rank among the best mines of the State. The work of opening the mine goes on and with the most encouraging result. Twenty tons of ore from their mine have been crushed at the Pugh mill during the month just closed, yielding the large return of \$195 per ton. After paying all expenses the owners of the mine have a surplus of over \$1,000 left. That this is encouraging, none will deny.

PROSPECTING is progressing vigorously, and a number of promising ledges are being examined. The lucky strike made by George Hurst recently has stimulated others to try their fortune, and it would not be surprising if other rich mines are discovered.

NEW HYDRAULIC MINE.—*Herald*, Feb. 12: A new hydraulic mine, we learn, is soon to be opened on the North fork, about opposite Clipper Gap. The claim has been well prospected and with the most flattering results. Every new enterprise adds to our wealth. Let them increase. There is no illuit to the opportunities in this comparatively new, yet extremely productive county.

CUEVAO FURNACE has been running quite successfully during the past week on Bells Union (one of the Geco Con. mines) ores. There are now on hand about 100 hers, some 1,100 having been shipped. There is now at the furnace for reduction 300 tons of ore, but in consequence of snow in the mountains a sufficient supply of coal has not been obtainable and the furnace has shut down for a few days until coal can be had.

ST. GEORGE.—Saturday last we visited Lookout district and took a look at the St. George mine, of which we have heretofore made mention. It is an immense gold bearing quartz ledge, easily traced by croppings on the surface a distance of one mile, having its course southeast-northwest. Upon that portion of the course

ble ledge claimed by the St. George company, in several places, we chipped off the surface rock and found it pure. The rock is a fine-grained and containing much sulphurets. George Thompson, the managing genius of the St. George, and he is doing good work in the country, putting it in shape. He makes his horn spout a few every day and thinks he can tell within a very few dollars what every ton of rock is worth now on the dump. If surface showing is any indication he has a good idea of what any one can see from the surface that is extensive. Old time miners have been in the park of Mr. Thompson's hospital in the way of a good miner's cover, which we enjoyed to the fullest after our ramble over the hills and rocky canons.

LIONHOUSE.—This mine is also in Lookout district, just south and running parallel with the St. George, and the rock is similar to and shows the same mineral. The ledge is easily traced, having equal prominence on the surface with the St. George, and has several separate locations upon it. Mr. P. Reddy, we learned, is the fortunate owner of one claim, upon which work is progressing. The two ledges (the St. George and the Lionhouse)

the Lighthouse), similar in character and having a parallel course, in our judgment, are the main leads of that immediate range. They are in a granite formation—just such a section as an old gold quartz aarp would look for were he out prospecting—and not unlike some of the best gold producing localities in older portions of our State. We would state here that an abundance of water can be found in the immediate vicinity of these mines.

THE IDA MINE.—This prettily named mine is located on an independent mound near the mouth of Snow canon, and is on a line with the St. George ledge, further southeast and near the western side of Panamint valley. The croppings are similar to the St. George and Lighthouse, but so far as prospected do not appear to be as rich with free gold. For convenience we like the location of the Ida very much, and we have no doubt it will make a good show in mineral as work progresses and handsomely reward the locator, that he may return to or send for the loved one who was before his mind's eye when he said, "the Ida."

NEVADA.
WHAT THE FRYER PROCESS IS DOING. — *Foothill Tidings*, Feb. 12: Meadow Lake ores, hitherto so refractory and intractable as to defy all efforts to obtain even 10 per cent. of the precious metals contained, are made to yield up their wealth without stint by the Fryer process.

THE PROSPECT.—The Omaha and other mines down along Wolf creek have lately been sending ore to the Fryer works for test by the new process, and with the most gratifying results; that from the Omaha turning out nearly double the yield obtained by mill process. Prospect stockholders are feeling well over their mine.

THE OMAHA MINE.—The Omaha mine, situated in that once famous region of rich mines—and now becoming to again—between the Istocky Bar and Allisou Ranch, just below New York Hill and close by the Lone Jack and Homeward Bound, has lately been showing of what mettle, or metal, she is made. A run of 15 days through a 10 stamp mill, 175 tons crushed, finished on Saturday last, gave a yield of \$9,000 or nearly \$55 per ton. The ledge is said to be large and good.

PLACER.

THE MINES AROUND OPHIR.—*Argus*, Feb. 12: The mines in the Ophir district are looking better than ever. The St. Patrick company, after great perseverance and many disappointments, have at last struck their

showed. Last month we detailed their operations and enhanced the good fortune in store for them. The work for January more than confirms all the brilliant hopes which were entertained. The quantity of running water available is far richer than any yet extracted. The body of it exposed is sufficient to supply their present milling facilities for years. During the month of January the mill crushed 440 tons of ore, from which was extracted 303 ounces of bullion. The St. Patrick bullion was sold at 100.00 per ounce, and the balance of the month \$14,171.75, an average of over \$32 per ton. Owing to the heavy rains which have saturated the ground, it was impossible to get up steam enough to run the stamps, and the running time of the mill was reduced to 10 days. Had the 15 stamps all been run the full month the yield would have increased full one-third, as there were several hundred

MINING EXCITEMENT.—The people of the northwest-
ern part of the county have been considerably agi-
tated recently by the announcement that an analysis
of the ore from the Bear River iron mine, lately made by
Prof. J. C. Davidson, of the University of California, re-
veals the development of a fact that it contained nearly
three per cent. of the element, which is so exceedingly
valuable, and is so very rare, and accordingly
is of very precious mineral, known as tellurium, which is
variously estimated to be worth from \$3,000 to \$5,000
per p. nd. We know but little of this substance,
though it is said to be so hard that an instrument made
of it will cut through common steel as steel cuts
through hard wood. It is, like, combined with other
rare qualities, that gives it such a high value. If the
ore in this mine contains, besides its fair percentage of
iron, a small amount of tellurium, as it is credited
with, and the tellurium is worth, say five hundred
pound, we do not wonder at the people in the section
of the country where it is located becoming excited,
for it is certainly the biggest thing on the Pacific coast,
the great bonanza not excepted.

THE SEASON PROSPECT.—Weaverville Journal, Feb. 12: In a mining point of view the present winter is decidedly the best ever experienced in this section. The water supply commenced earlier than usual and has continued continuously, with a certainty of lasting longer than any previous season. The mountains are covered with snow many feet deep. The storms have come with such regularity and at such opportune times, that we don't believe the miners themselves could improve or the present season even had they the power to control the elements. Cold weather has not in the least interfered with the working of the mines, and, in fact, everything in the weather line has been just as good and beneficial as possible. The miners from one end of the county to the other are improving their time and the spreading opportunities presented by the favorable season. Many of them are working continuously, and there are none but have done much more work this winter than all of last year. As indicated by the few partial clean-ups thus far made, our mines should yield as much this season as they have during the past three or four combined.

TUOLUMNE.

GARATE Correspondence of the *Independent*, Feb. 12: The Nonpareil company at Deer Flat steadily prosecuted the work of driving a tunnel, which has, after many years of toil, and the expenditure of not less than \$60,000, reached the vein several hundred feet below the surface, and they are now amply rewarded for their toil and endurance by the discovery of large bod.

Expense—only three miners being required to keep a ten stamp mill supplied with rock. The mill is driven by a steam engine of 30 horse power, which through an eight inch pipe with one and a half inch nozzle, coming upon a ten foot hurdy gurdy wheel, which gives a powerful and steady motion. Water costs only \$4 per day. They have also a steam engine nearly ready which is intended to be used when water cannot be had. There is a fair percentage of rich sulphurates in the rock, and to save these a concentrator is attached to the mill, which concentrates the ore without much labor and very little loss. The Banders mill and mill is located on the North fork of the Merced river, and has been in operation with only an occasional suspension for many years. The mill is propelled by an over-shot wheel; water free most of the year. The rock is usually abundant and always rich. It also contains a very small percentage of very rich sulphurates. It is owned by one of Schofield's concentrators. The Superintendent, Mr. J. W. Brown, informs that the mill has recently struck it richer than ever in the lower levels, and are now running their ten stamp mill on excellent ore, with fair hopes that it will long continue. The company are now erecting a turbine wheel for the purpose of compressing air for a Burleigh drilling machine, as they are about starting a tunnel near the river, and to strike the vein low down and also have a detour.

Messrs. J. W. Tripp & Co., the principal owners of the above mine, also have recently purchased several mines on and near Big creek, and are now engaged erecting a ten stamp mill with most of the modern improvements now in use. The power is a turbine water wheel with 44 feet fall. The mines have formerly been worked, and ore crushed by a five-stamp mill, which had nearly rotted down, and has been entirely removed to make room for the new one, which leaves a very solid structure, and is expected to be ready to run in about three weeks.

On Diamond gulch, about one mile from this place, there is a two-stamp mill which runs by compressed air—the air being compressed by steam power. The stamps are said to weigh only 250 pounds, but strike with a force of 1,500 pounds, and crush from seven to ten tons per day. I cannot say at present whether this machine is a success or not.

ALTA.—Gold Hill News, Feb. 10: Sinking the main shaft is going steadily forward, the bottom in good working ground, and excellent progress is being made. Gwing to the strong pocket of water recently struck, the company has resolved to commence the erection of pumping machinery of the same pattern as the Consolidated Virginia.

AMAZON AND GLASGOW.—A day or two since a strong flow of water was encountered in the north drift on the 300-ft level, which has driven the men out, and stopped work in that portion of the mine at present. The ore vein is showing strong and heavy going northward, and some good results are confidently looked for when the water is once extracted. A large Blake's pump has been ordered and already shipped from San Francisco, and will arrive in a day or two more. As soon as it arrives it will be set up, and work in the mine resumed. New boilers have also been ordered and will arrive about the same time as the pumping machinery.

BALTIMORE AND AMERICAN FLAG.—Sinking the main incline is going rapidly forward, the bottom in good working ground. The pumps are finished and working finely, down to the 1050-ft level. The main east drift on the 1000-ft level is still advancing, the face of the drift in ledge material of a favorable character. The new air compressor for driving the Burleigh drills is placed at the bottom of the incline. The water pipes are now laid in position, for connecting with the drill at the bottom of the incline, much better progress may be expected in sinking the incline.

BEST AND BELCHER.--Still repairing the double winze below the 1600-ft level, having 38 feet yet to go to reach the 1700-ft level.

BULLION.—The northwest drift on the 2000-ft level of the limerick is steadily advancing toward the ore vein. The upraise from the 1700-ft level, to connect with the bottom of the incline, is also making excellent headway. Sinking the main incline below the 1400-ft level is being pushed forward at the rate of four feet per day. The erection of the ore shutes at the 800-ft

LEVEL is making good progress.

CALIFORNIA.—Sinking the main shaft is making steady headway. The pump at the 800-ft level is finished. The flow of water at the bottom of the shaft is not so great as it was a week or two since, and the pumps are now handling it with much greater ease.

CALIFORNIA.—The north drift on the 1550-ft level is still advancing, the face in good ore. Another winze has been started from cross-cut No. 5 to connect with the lateral north drift. The south drift on the 1550-ft level, Sinking the C. & C. shaft goes vigorously forward, the bottom in good working ground. A small engine has been erected to be used in lowering the heavy pumps and columns into place. This will be a great improvement over the old style of lowering them by hand, and assist greatly in the prosecution of the work.

CAOLLAR POSI.—Daily yield, 50 tons of ore, the assay value of which is \$28 per ton. No change in either the yield or quality of the ore extracted. The south drifts on the 1250 and 1350-ft levels are both steadily advancing, with no new or favorable indications to note. Sinking the Combination shaft is making excellent progress.

CONS. VIRGINIA.—Daily yield, 650 tone of ore, keeping the mills all running up to their full crushing capacity. There is no apparent change in the appearance of the ore breasts or the quality of the ore extracted. The shipments of bullion up to last evening were \$258 - 445.56, in excess of that of January at the same date in the month, a showing that proves conclusively that the returns of the new California mill is beginning to make itself known. The California mill is now crushing regularly 300 tons of ore per day. The pen mill has a capacity of about 350 tons. The cold, snow weather of the past few days has not interfered in the least with the operations of either mine or mills, and the prospects are, that although a short month, the yield of bullion for the month of February will exceed that of any previous month since the opening of the great ore body.

CAWON POINT.—The usual amount of ore is being extracted and milled, without any change in quality or value. The main east drift from the 1700-ft level is steadily advancing, without having yet reached the south winze. The main west drift is about 100 feet from the south winze. The drift is in fine quartz and low grade ore, which gives average assay of \$12 to \$15 per ton. The main south drift on the 1600-ft level is still showing some excellent ore prospects, and has about 70 feet to yet run to connect with south winze No. 2, which is being sunk from the 1600-ft level. This winze has about 70 feet to sink to reach the level of the 1600-ft drift. Soon as the connection between the two levels is completed, and ventilation obtained so as to permit it, cross-cutting will be started to determine the width and extent of the ore body on the 1600-ft level.

DAYTON.—Sinking the main shaft is making excellent progress, notwithstanding the rock in the face is somewhat harder than it has been for some time past. The north and south prospecting drifts, on the 500-ft level, are steadily advancing, running parallel with the ore vein. There are no new features to report of these drifts. The main couth drift, on the 300-ft level, is also making good progress. No change in the character of the rock.

FLORIDA.—The new hoisting machinery being placed into position is of a powerful and substantial description, and will do effective service.

GOULN & QUARRY.—Re-timbering the main shaft is going steadily forward. Nothing doing yet on the 1700-ft level.

HALE & NOACAOS.—The mine is still flooded by the flow of water from the Savage. The pumps are kept running up to their full working capacity, but as yet produce no impression on the immense body of water with which they have to contend.

IMPERIAL EMPIRE.—Daily yield, 40 tons of ore. The ore breasts show but little if any change during the week. The main north drift on the 2000-ft level is showing very favorably, and is steadily advancing toward the north line. Nothing new to report of any of the other prospecting drifts.

JULIA.—Sinking the main shaft is going forward at the rate of five feet per day, the Burleigh drill operating splendidly, and the work being pressed with all energy possible. The main southwest drift on the 1600-ft level is also being penehed vigorously forward, the face in very favorable vein matter. The main northeast drift is being penehed at the rate of steadily advancing at the rate of four feet per day. No material change in any other portions of the mine.

JURTOR.—Face of the south drift at the 800-ft level in low grade ore. A winze is being sunk from the 600-ft level to connect with the 800 for air circulation purposes and exploration. It is being sunk at an eligible point and will be completed to the 800 in three or four weeks; it is to be eventually completed to the 1000-ft level. A plunger pump is put in to reduce the water and aid operations at the 1600-ft level, mining next to the surface and the 400- and 600-ft levels is suspended on account of the bad state of the roads, preventing hauling onto the mill.

KNICKERBOCKE.—The pumps are kept steadily running and are doing excellent work, steadily lowering the water in the shaft. There is now but a few feet of water in the sump, and that will be exhausted in less than a week's time. When this is accomplished the long delayed work of developing the lower levels will be vigorously pushed ahead and the Knickerbocker will come to the front.

KOERTZ.—Sinking the shaft is progressing at the rate of five feet per day. The main south drift on the 500-ft level is advancing steadily, the face in fair working ground. It is now in 130 feet. The main south drift on the 350-ft level is now in a distance of 420 feet, the face in fine quartz and low grade ore. The east cross-cut from this drift has penetrated the ore vein a distance of 70 feet, the face being still in fine quartz.

LADY BETAN.—Sinking the main shaft is going steadily forward, the bottom all in quartz and ore. The cross-cut from the south level is also making good headway, and is coming to a level very nearly parallel with the course of the drift. \$50.00 of this ore are very rich, assaying as high as \$100.00 per ton. Average assays give a result of \$40.00 and upward for the present. The drift is about 250 ft. thick, and is also showing a steady improvement, and will in all probability soon strike the same rich ore found on the level above. Cross-cuts on the 330-ft level are being made in the direction of both the north and south headings.

LADY WASHINGTON.—The pump column is completed, the plunger and rods in place to-day, the tank and station at the 530-ft level finished, and to-morrow the

California and Colorado Loco Poisons.

The following paper was read before the California Academy of Sciences by Dr. A. Kellogg.

During the last generation, or about fifteen years ago, the poisoning of horses, cattle and sheep, by the cattle-weed, Pompona pea, or Pop pon, Menzie's milk vetch, (*Astragalus Menziesii*—Gray.) of the vicinity of San Francisco, came to our knowledge, and innumerable instances since, reported from all parts of the coast where it abounds, have only served to confirm these observations. How long it has been known to the native Californian, we are unable to say; but reiterated experience has taught sad lessons to independent observers everywhere. To some, however, the cause of their misfortunes is still a mystery. We have reason to know that there are also other similar causes of which we shall treat hereafter. This subject has been frequently brought before the Academy, but no record hitherto appears in the proceedings. This and some allied forms have been figured and published here, so that the public may have supposed to be somewhat familiar with it. The plant has much the appearance of bladder fern. As no chemical analysis has been made, nor any carefully noted experiments tried on animals, all we know is the serious results, often obscurely and imperfectly reported by the farmer, ranchero, herder and the shepherd.

Horses and cattle in this vicinity, we notice, shun it so long as the pasturage is good, but as it becomes bare and hunger impels, they bite it and become narcotized, or as we may say, intoxicated; they stagger and are unsteady in all their movements, act strangely and stupidly, and seem to lose their good horse sense or common brute sagacity, acting like a fool; hence the Mexican name "loco" given to it. At length they become thinner and cannot be restored to "condition"—they get to like the weed more and more, apparently infatuated, as the Sandwich Islander for his ava (*Crucian Piper methysticum* in water), or the drunkard for his bottle; if only slightly "locoed" they are scarcely fit for general use, because so unreliable in perilous paths, or emergencies, acting so like fools, to the shame of all sensible animals. What is most remarkable with both this and the Colorado "loco" is the permanence of the impression, often lingering for many months or even years, half demented, until at length they die.

Death often supervenes suddenly; the effect is similar with horned cattle and sheep. This rattling weed is by no means confined to damp ground, but thrives equally on dry hills, in all soils. It has a tall and leafy stem or stems in bunches from a common perennial root, leaflets many paired (twenty or more), stipules at the base of the leaves triangularly membranous—flowers, dirty pale yellowish or whitish tinged with red, mostly but forcibly back. Pods inflated, about two inches long and thinly membranous, indeed so bladder-like that boys amuse themselves by popping them—hence the name "Pop pea."

Herders are in the habit of "prospecting" their proposed pastures, especially for sheep, before moving their flock. A few, rather than shun or abandon their fields, have very sensibly made war on it with the grubbing hoe; others less cautious, or totally ignorant, have lost as high as \$800 in one instance. I have been told that miners eat the beans with impunity, and some have contended that the poisoning is from worms on the weed—fungi also have been credited with it. Had we not an allied Colorado "loco" and the *Tephrosia*, or devil's shoestring of the South, which stupefy and intoxicate, besides others corroborating, some doubt might possibly be entertained.

Lamher's milk vetch of Colorado, *Oxytropis Lamheri*, Pursh, (*Astragalus Lamheri*, Spreng), consists of about six to eight varieties, for which, for all popular purposes, one description might suffice. Roots perennial; they are all stemless, or nearly so—not considering the flower or fruit scape as such; they grow in tufts or stool-like suckers, spring out by very short branches from the root crown; are more or less silvery, satiny, silky in every part; the common leaf stem is about three inches long, the upper oddly pinnate portion nearly equal, or the whole length of leaf about six inches, but much shorter than the flower scape stem; the pea blossom flowers purplish, or blue and white, violet or ochroleucous; leaflets, three to fourteen pairs, usually about eight or nine; stipular appendages at the base of the leaves, at or under the soil. Sheathing pods white, satiny, silky, with short, close pressed hairs, erect, somewhat cylindric, one-half to one inch long, sharpening out at the point and partly two-celled.

Found from Saskatchewan to Texas, New Mexico, West to Rocky mountains, and Colorado to Washington Territory, and according to Hooker, to Arctic America and Labrador.

Of this species of loco we have no personal observation. Assistant Surgeon P. Moffatt, U. S. A., writing from Fort Garland, Col., says cattle men inform him that the weed abounds in damp grounds among grass, and poisons many horned cattle and horses; he is assured that after eating it the animal may linger for many months or a year or two, but they invariably die from its effects. The animal does not lose flesh, apparently, but totters on its limbs and becomes crazy. While in this con-

dition a cow will lose her calf and never find it again, and will not recognize it when presented to her. The eyesight becomes affected, so that the animal has no knowledge of distances, but will make an effort to step or jump over a stream or obstacle while at a distance off, but will plunge into it or walk up against it on arriving at it. The plant pointed out to him seemed to be related to the lupin.

Our Exports by Rail.

From its situation, this city ought to have a large and growing trade with all interior parts of the continent accessible by rail from this city. The expectation that the transcontinental road would be the medium of an active commerce between the East and the West, it was which induced the nation to aid the project so lavishly with credit and lands. To a great extent, this expectation has been realized, but not to as great a one as the people of the Pacific slope have had reason to expect. We do not now care to enter into the causes of this; suffice it to say, however, that the future points to the growth of a vast and important trade between this city and the commercial centers of the Mississippi Valley, the Atlantic slope and Canada, nay, even far distant Europe. In our progress towards this consummation, however, we must expect an occasional set-back, and such a one we have received during the past year, to judge from the annual statistics recently published by the railroad. They show that there has been a decline in the amount of freight carried East by rail of 35,041,942 pounds as compared with 1874; that is a decline of about 25 per cent. This decline has taken place principally in Barley, and in General Merchandise (unspecified).

Of Antimony, a new export by rail, 265,074 pounds were shipped during the year. Of Barley, only 58,282.31 cents were shipped as against 378,964.23 cents in 1874. This shows a great falling in of Eastern demand. Of Borax, we sent 1,320,157 pounds, somewhat less than the shipments of 1874, though double those of 1873. Of Beans, 436,833 pounds were shipped as against 101,930 pound in 1874, and a smaller quantity in 1873, showing an increase of over 450 per cent. We shipped 23,000 gallons of Brandy East and 400,000 gallons of Wine, as against none of the former and 500,000 gallons of the latter in 1874. About one-third more Coffee was shipped to St. Louis and Chicago, to relieve the market, than in 1873, the figures being 926,353 pounds for the former year and 1,281,384 pounds for the latter. A heavy decrease is notable in Green and Dried Fruits, of the latter only one-seventh, and of the former, only a third of the amounts of 1874 having been shipped. The quantity of Hops shipped in 1875 was only 326,172 pounds as opposed to 794,186 pounds in 1873. In Leather a decline is also noticeable, the amount for 1875 being only 558,222 pounds as opposed to 735,739 pounds in 1874. The amount of General Merchandise shipped in 1875 was only 4,278,542 pounds, whereas it was 8,230,123 pounds, or nearly double, in 1874. There was an increase however in Salmon, the quantity going East in 1875 being 112,000 cases as against 107,000 cases the previous year. Of Quicksilver, 798,232 pounds were shipped in 1875 and 425,435 pounds in 1874. The quantity of Silk in 1875, sent overland, was three times that of 1874, while that of Skins and Furs was nearly sevenfold. Of Syrup we shipped 220,000 gallons in 1875, not half of that shipped the previous year. The quantity of Tea increased in 1875 by seven million pounds over 1874. And the increasing product of Wool is shown in shipments of 39,315,966 pounds last year as opposed to 30,169,191 pounds in the previous year, and 26,100,964 pounds in 1873. All these figures apply to shipments from San Francisco. The following tables, taken from the columns of a commercial contemporary, give the exports by rail in detail:

	1873.	1874.	1875.
Antimony.....	265,074	265,074	265,074
Alfalfa Seed.....	3,453	5,522	5,522
Almonds.....	100	100	100
Barley.....	1,217,081	37,896,423	5,828,241
Borax.....	619,449	1,497,360	1,320,157
Beans.....	98,349	101,930	436,833
Base Bullion.....	40,436	40,436	40,436
Butter.....	230,889	250,513	2,590
Brandy.....	181,851	181,851	181,851
Bacon.....	12,840	12,840	12,840
Building Materials.....	12,840	12,840	12,840
Copper.....	410,855	410,855	410,855
Cocoons.....	20,742	20,742	20,742
Canned Goods.....	655,865	1,132,291	571,175
Cotton, Foreign.....	193,343	193,343	193,343
Cotton, Domestic.....	3,475	3,475	3,475
Coffee.....	4,101,836	926,353	1,281,384
Clothing.....	17,004	17,004	17,004
Cochineal.....	11,445	11,445	11,445
Canal Wool.....	8,150	8,150	8,150
Coal.....	20,169	20,169	20,169
Cigars.....	46,806	46,806	46,806
Cement.....	40,730	40,730	40,730
Circuits.....	20,000	20,000	20,000
Domestic Flax.....	16,323	16,323	16,323
Dried Beef.....	6,522	6,522	6,522
Dried Goods.....	20,275	20,275	20,275
Dry Goods.....	2,612	2,612	2,612
Empty Tank Cars.....	60,000	60,000	60,000
Empty Packages.....	26,712	26,712	26,712
Fruit, Green.....	87,583	289,494	42,332
Fruit, Dried.....	93,271	1,351,385	433,717
Flour.....	68,414	68,414	68,414
Flax.....	168,725	20,515	40,555
Fans.....	64,508	64,508	64,508
Fire Escape Machines.....	40,000	40,000	40,000
Gold Hair.....	1,054	1,054	1,054
Glue.....	369,876	340,750	322,622
Giant Powder.....	1,080	25,461	5,380
Honey.....	41,129	556,554	565,238
Hides and Pelts.....	409,384	1,700,551	1,700,551
Human Hair.....	7,742	7,742	7,742
Horns.....	30,400	30,400	30,400
Hops.....	319,003	794,186	326,172
Ivory.....	41,099	10,623	550
Japan Goods.....	50,000	50,000	50,000
Locomotive Cars.....	151,169	40,000	558,222
Lead.....	1,151,524	40,000	40,000
Laths.....	40,000	40,000	40,000
Lumber.....	380,200	1,810,452	348,530
Lily Bulbs.....	22,110	22,110	22,110
Machinery.....	75,284	372,610	14,375
Malt.....	1,811,567	224,160	224,160
Matting.....	143,135	22,250	22,250
Mustard.....	27,424	16,371	16,371
Mustard Seed.....	41,040	177,984	120,375
Merchandise.....	2,079,119	8,230,123	4,278,542
Metal.....	23,642	23,642	23,642

Marble.....	1873.	1874.	1875.
Nutmegs.....	22,358	22,358	22,358
Oil.....	111,399	111,399	111,399
Whale.....	20,250	20,250	20,250
Sperm.....	42,904	42,904	42,904
Oranges.....	20,000	20,000	20,000
Peanuts.....	15,182	15,182	15,182
Pump Loge.....	121,692	121,692	121,692
Sage Iron.....	20,000	20,000	20,000
Plows.....	61,600	61,600	61,600
Powder.....	68,340	350,624	311,325
Pepper.....	95,640	95,640	95,640
Paper.....	20,000	20,000	20,000
Quicksilver.....	382,850	428,485	758,232
Rice.....	255,000	300,155	20,400
Rags.....	60,110	60,110	60,110
Red Oil.....	242,570	242,570	242,570
Raisins.....	20,320	20,320	20,320
Silk Goods.....	877,219	252,811	882,788
Silk.....	3,427,963	6,432,021	6,432,021
Silkworm.....	1,691,436	224,578	1,546,096
Silks and Furs.....	110,150	60,259	1,509
Sugar.....	382,850	382,850	382,850
Slag.....	22,000	22,000	22,000
Shells.....	9,400	9,400	9,400
Seal Skins.....	1,472,860	1,472,860	1,472,860
Shingles.....	20,150	20,150	20,150
Shale.....	65,970	65,970	65,970
Stock.....	27,000	27,000	27,000
Seeds.....	39,685	39,685	39,685
Sisal Lanes.....	20,000	20,000	20,000
Salt.....	19,406	19,406	19,406
Tobacco.....	72,938	72,938	72,938
Tan Barks.....	24,350	24,350	24,350
Tea.....	12,726,365	11,778,756	18,136,424
Vegetables.....	21,750	21,750	21,750
Wine.....	4,916,587	3,978,330	3,978,330
Wool, Domestic.....	26,100,964	30,169,191	39,315,966
Wool, Australian.....	978,158	978,158	978,158
Whalebone.....	144,212	337,639	238,535
Walrus.....	143,060	143,060	143,060
Wheat.....	20,570	21,180	37,551
Whisky.....	66,273	66,273	66,273
Woolen Goods.....	57,350	57,350	57,350
Woods.....	57,350	57,350	57,350
Wax.....	330	330	330

FROM SAN JOSE.	4,390	5,197	5,197
Blankets.....	5,920,189	2,307,520	2,307,520
Barley.....	5,177	5,177	5,177
California Cloth.....	732	732	732
Clothing.....	185	185	185
Carpet.....	150	205,531	227,490
Canned Goods.....	26,620	26,620	26,620
Cigars.....	29,490	29,490	29,490
Flour.....	54	45,357	250,374
Fruit, Dried.....	1,568,900	1,562,911	1,424,170
Fruit, Green.....	60,177	60,177	60,177
Furs and Skins.....	26,409	26,409	26,409
Hop Roots.....	9,552	9,552	9,552
Leather.....	1,040	1,040	1,040
Lumber.....	21,745	21,745	21,745
Merchandise.....	150	150	150
Machinery.....	150	150	150
Malt.....	15,950	15,950	15,950
Meat.....	40,811	40,811	40,811
Oil.....	100	100	100
Quicksilver.....	49,003	22,758	84,500
Salmon.....	288,015	288,015	288,015
Seeds.....	16,200	16,200	16,200
Tobacco.....	43,256	17,104	9,040
Wine.....	5,191	7,986	9,040
Woolen Goods.....	20,570	20,570	20,570
Wheat.....	20,570	20,570	20,570
Wool.....	20,570	20,570	20,570

FROM STOCKTON.	145	145	145
Agricultural Implements.....	651	651	651
Clothing.....	117	117	117
Canned Goods.....	400	80,000	80,000
Flour.....	400	1,080	1,080
Fruit, Green.....	200	6,005	1,392
Fruit, Dried.....	224	6,005	1,392
Furs.....	408	408	408
Leather.....	58,175	19,419	359
Household Goods.....	20,000	20,000	20,000
Hops.....	14,100	14,100	14,100
Honey.....	179	179	179
Merchandise.....	15,291	16,534	9,013
Stock.....	20,000	20,000	20,000
Skins.....	173	173	173
Wine.....	37,470	64,711	64,711
Wool.....	37,470	37,470	37,470

FROM SACRAMENTO.	1,307,417	687,352	102,823
Barley.....	38,930	38,930	38,930
Brandy.....	28,485	28,485	28,485
Borax.....	12,125	12,125	12,125
Copper Ore.....	20,000	20,000	20,000
Canned Goods.....	20,000	20,000	20,000
Chicory.....	38,935	38,935	38,935
Corn Cement.....	34,385	34,385	34,385
Dry Goods.....	30,000	30,000	30,000
Empty Oil Tanks.....	30,000	30,000	30,000
Fish.....	20,730	20,730	20,730
Fruit, Green.....	924,900	2,638,492	1,205,803
Fruit, Dried.....	68,808	68,808	68,808
Flour.....	350,000	400,600	260,200
Guns.....	28,400	28,400	28,400
Hops.....	118,925	220,941	220,941
Honey.....	1,900	1,900	1,900
Leather.....	300	300	300
Lumber.....	20,000	20,000	20,000
Merchandise.....	471,856	1,251,553	583,820
Malt.....	328,025	328,025	328,025
Machinery.....	248,645	248,645	248,645
Nuts.....	337	337	337
Powder.....	22,200	22,200	22,200
Salmon.....	106,045	102,640	102,640
Stock.....	20,000	20,000	20,000
Telegraph Poles.....	22,200	22,200	22,200
Vegetables.....	22,200	22,200	22,200
Wool, Domestic.....	1,128,161	1,871,884	1,629,802
Wine.....	458,116	416,300	977,110
Wheat.....	199,967	199,967	199,967

FROM MARYSVILLE.			
Agricultural Implements.....	927		135
Alfalfa Seed.....			25
Barley.....			22,460
Blankets.....	100	392	4,871
Barley.....	1,009,355		28,840
Clothing.....	1,355		1,355
Castings.....		11,053	
Canned Goods.....	130		130
Domestic.....		1,383	
Dry Goods.....			281
Flour.....	1,300,800		1,300,800
Fruit, Dried.....	161	1,456	161
Fruit, Green.....	220,000	647,848	121,000
Fish.....	161		161
Grass Seed.....		1,895	
Honey.....		1,600	
Hides and Pelts.....		231,453	125,504
Iron Castings.....		60	40
Merchandise.....	12,008	38,734	26,355
Machinery.....	7,112	42,248	
Ore.....		42,248	
Cassins.....		2,715	94,355
Seeds.....		10	
Tea.....		400	
Vegetables.....		292	
Wine.....	29,122	76,716	156,833
Wheat.....	305	559	
Woolen Goods.....		2,723	
Wool.....	58,729		36

USEFUL INFORMATION.

Pedestrian Training.

Pedestrianism, as an athletic exercise, has become deservedly popular. There is no course of gymnastics so well calculated to develop a large number of muscles, or to produce so beneficial an effect upon the system. There is a right way and a wrong way of walking—the one beneficial, the other negative in its result. What the right way is, a writer in an English contemporary tells us in the following:

The body must be held erect, with head well thrown back; the movement of the legs must be from the hip downward, and the body should be carried motionless. The arms should be swung well forward in harmony with the legs, and the elbow should, when in front, be nearly on a level and at almost right angles with the chin, the hands being open and extended. The leg should be brought well round from the hip, and the heel deposited on the ground in line with the rear foot, so as to leave your foot-marks pretty nearly in a line. But above all things hold your head up and the body erect.

Stitches and other kindred annoyances are common in learning to walk, but the beginner would do well to walk it off, and never ease if seized with distress. To do so is to throw away the pace he has acquired from the commencement of his walk, and to knock all the regularity out of his stride.

FACTS WORTH REMEMBERING.—A correspondent gives the following useful recipes: If you have been pickling or handling any acid fruit, and have stained your hands, wash them in clear water, wipe them lightly, and while they are yet moist, strike a match and shut your hands around it so as to catch the smoke, and the stains will disappear. If you have stained your muslin or gingham dress, or your white pants with berries, before wetting with anything else, pour boiling water through the stains, and they will disappear. Before fruit juice dries it can be often removed with cold water, using a sponge and towel if necessary. Rubbing the fingers with the inside of the paring of apples will remove most of the stain caused by paring.

To clean and restore the elasticity of cane chair bottoms: Turn the chair bottom upward, and with hot water and a sponge wash the cane; work well, so that it be well soaked; should it be dirty, use soap; let it dry well in the air, and it will be as tight and firm as new, provided none of the canes are broken.

Match mats can be made of ordinary sand paper, cut in circular and octagonal shapes, fastened upon pasteboard and bound with bright-colored braids, a riag attached to each, and the whole hung near the match safe for use whenever a match is lighted. The unsightly marks that disfigure many walls may, by this inexpensive and simple arrangement, be entirely prevented. There should be one in every room in the house.

A Pre-Historic tomb has recently been discovered in Dedham, Mass., at a point near the banks of the Charles river, about nine miles south of Boston. The tomb consists of a horizontal 10-foot excavation into a hill—the mouth of the arch of Roman shape, the walls and floor carefully built of unhewn stone, laid in mud plaster, innocent of lime. The central portion of the tomb was about 10 feet in diameter each way. A mass of masonry, unconfined, and apparently the remains of an incriminated body, occupied the center of the floor. No other remains or relics of any character whatever were found.

Various speculations are indulged with regard to the origin of the subterranean structure. It certainly was not of Indian origin, and differs altogether from any of the pre-historic remains so plentiful in the Mississippi Valley. Was it the remains of one of the early Norsemen who are known to have visited that coast some centuries before the discovery of Columbus? Most likely it was. It is not far from the famous Dighton rock, so well known from its curious, and, as yet, uninterpreted inscriptions; or from the spot where the body of a helmeted warrior—an undoubted European—was exhumed a few years ago. The Cambridge savans have the matter before them for elucidation. Their report is awaited with considerable interest.

AIR AND SUNLIGHT.—From an acorn weighing a few grains, a tree will grow 100 years or more, weighing several tons. A large part of this growth is derived from the sun, air, and water—but little from the earth. Wood and coal are but condensed sunshine, which contains three elements equally important to animal and vegetable life—magnesia, lime, and iron in the blood, which gives it its sparkling red color and strength; the lime in the bones imparts to them the durability necessary to bodily vigor, while the magnesia is important to many of the tissues. Thus, the mere sunlight we enjoy the healthier we shall be and the longer will life endure.

To remove tarnish from plated goods that have turned dark from the action of gas, steep the plated ware in soap lye for two hours, then cover it over with whiting, wet with vinegar, so that it may stick well upon it, and dry it by the fire; by thus drying the whiting is removed from the crevices without the least difficulty. Rub off the whiting and pass over it with dry bran. The silver will look exceedingly bright.

HOW THE INNER SURFACE OF GLASS REFLECTS LIGHT.—Some one asks the *Scientific American* to explain the reflection of a ray of light from the inner surfaces of glass, diamonds, drops of water, and other transparent substances, causing the brilliancy of the diamond, the formation of the rainbow, etc. That journal answers as follows: The reflection from the inner surface of a transparent medium is similar to that from the outer surface. (Observation and experiment have proved that it is a universal law that, when light passes from a dense into a rare medium, or vice versa, a part of the light is reflected in such a direction that the angles of reflection and incidence are equal. When, therefore, the surface between the two media is perfectly even, it acts like a mirror, and the smooth surface of still water is as good a reflecting mirror for the fishes under it as for men above, of which fact you may easily satisfy yourself by observing an aquarium. A piece of plate glass will also convince you of this by two reflections, one from the front and one from the back or interior surface, giving you two reflected images, which will coincide when the light falls perpendicularly, but become separated when the light is made to fall obliquely. The colors shown by diamonds or raindrops in the rainbow are not due to this reflection, but to the refraction of the rays when they enter and leave the diamonds or water drops; for the explanation of this we refer you to any modern text book on natural philosophy.)

BOILING OIL.—The *Industrial Monthly* says: Do not buy oil which has been treated with litharge, burnt umber, red oxide of lead or vitrol (blue or white,) or sugar of lead, or manganese, or any other siccative. Oil should be boiled in a copper kettle, if possible, set in masonry, and should be thoroughly stirred. While boiling, pieces of toasted bread should be occasionally floated on top of the boiling oil to remove the moisture; pieces of charcoal would answer the same purpose, and would do for fuel afterward. A furnace should be situated in the open air so as to allow the disagreeable vapor to escape, and should be built in such a way that no smoke or blaze could get to the oil, for if your oil gets smoked, it will spoil it in a measure for light colored work, and if the blaze can come near the oil, you run the risk of a fire, as oil at a high temperature evolves an inflammable gas. With oil prepared in this way you can do a better and more lasting job, and will find it to wipe out easier and not show so many brush marks; will not crawl if your under coatings are dry. Your wearing varnish will not strike in any more in one part than another.

PURIFYING WATER WITH ALUM.—Alum will only purify water from organic impurities, which it will precipitate in the same manner as it precipitates dissolved coloring matter in the manufacture of lakes from dye woods, etc. One teaspoonful of pulverized alum in four gallons of water is sufficient; if the water contains such an amount of impurities that this quantity will not purify it, it is unfit for drinking purposes. In the artificial manufacture of ice from Mississippi river water, at New Orleans, this method is employed to purify the water before freezing it.

HOW WHITE SHIRT BUTTONS ARE MADE.—Some varieties of these buttons are made as follows: Finely powdered statite is saturated with soluble glass, dried and repulverized, and the powder thus obtained is pressed into molds by suitable machinery. They are then baked or fired in ovens, again dipped in solution of soluble glass and subjected a second time to the firing process. When cold they are polished by being placed in a rotating cask with water, dried, and again polished by rotation in a similar cask with soapstone powder.

AN ANCIENT WOOLLEN FACTORY.—At Pompeii a small woollen factory has just been discovered, near the house where the renowned fresco of Opheneas was recently found. In this factory are still seen pieces of woollen cloth, quite carbonized, and many instruments for carding and weaving similar to those used in some small factories of this kind at the present day.

A FAST YACHT.—Buffalo has a new steel built steam yacht, only 80 feet long, 10 feet beam, which runs at the rate of 20 miles an hour.

PERPETUAL INK FOR TOMBSTONES, ETC.—Pitch, eleven pounds; lampblack, one pound; turpentine sufficient; mix with heat.

GOOD HEALTH.

PARALYSIS.—One of the physiological observers of men and things says paralysis is becoming a common disease. It is not confined to the fleshy, the plethoric, nor the aged. The fast life of our young business men tells on them. It is a very common thing to see men of 30 and 35 bald-headed, feeble gaited, and walking about with canes, their underpinning knocked out, with other signs of premature age. These signs of early weakness develop in paralysis.

To prevent the skin discoloring after a bruise, take a little dry starch or arrowroot, merely moisten it with cold water, and place it on the injured part. This is best done immediately, so as to prevent the action of the air upon the skin. Invaluable for black eyes.

Childhood's Infectious Diseases.

The *Lancet* calls attention to the importance, in the present state of the public health, of securing the early detection of cases of scarlet fever. It is of consequence not only to the patient but also to the community, in order that timely measures may be taken for preventing the spread of the disease. The *Lancet* says that the throat symptoms are the most trustworthy for the purpose of diagnosis in the initial stage of scarlet fever. The soft part of the palate is extensively reddened, and not merely the tonsils, as is the case in the first instance in ordinary sore throat. When this condition is met with, accompanied by a very hot skin and a very quick pulse, accompanied or preceded by sickness, with a thickly furrowed tongue, red borders, and prominent papillae, a case of scarlet fever may be prepared for. In most cases, adds the *Lancet*, sickness occurs within 24 hours after the commencement of the attack, and in a large proportion of the cases it occurs within 21 or 18 hours.

The *Lancet* addresses itself to the medical men, but there are so many parents who have a wholesome fear of calling in the doctor to their families if they can avoid it, that it is well for the signs to be widely known during the present prevalence of scarlet fever, by which they may ascertain that they will have finally to resort to him. Seeing, too, the number of the children of the poorer classes now daily gathered together in schools, it would be a wise precaution for the authorities to issue to schoolmasters and schoolmistresses some plain directions for the detection of this and other infectious maladies common to childhood, by which, in the event of complaints of illness on the part of any of their pupils, they might become aware of suspicious cases and take their measures accordingly. In the absence of such or a similar safeguard, schools in crowded districts may play no small part in assisting the progress of the epidemics of the future.

SURGICAL TREATMENT FOR CONSUMPTION.—Professor Mosler, of Germany, is now successfully treating pulmonary consumption, by making an incision through the wall of the chest and drawing off the pus with the syringe, and afterwards washing out the ulcers with weak carbolic acid. No difficulty appears to have been experienced in the operation, and the condition of the patient was improved, the cough becoming less troublesome, and the febrile symptoms apparently moderated. One point, at least, is regarded as settled—and it is certainly one of great importance—so far as could be by a few experiments of this character, namely, that the local treatment of pulmonary cavities is undoubtedly practicable, and that the lung is really more tolerant of external interference than has been generally believed. The uses of carbolic acid are rapidly extending, and it bids fair to become one of the most valuable articles of the materia medica. It appears to be speedy death to diseased germs and fungus growth.

FUNGI IN DISEASE.—At a recent meeting of the Newark, N. J., Scientific Association, the President, Dr. Edwards, called the attention of the members to the connection of microscopic fungi with disease in animals and plants. In the discussion on the connection of fungi with diphtheria it was asserted that the parasitic fungus is always present in the diphtheritic membrane. Whether this was a cause or a simple accompaniment of the disease was undecided. Dr. Edwards stated that whatever would destroy the fungus would cure the disease, and that he had secured very satisfactory results by the use of salicylic acid.

THE HUMAN BITE.—Near Cincinnati, a short time ago, two men engaged in a fight. During the melee one of them bit the other's eyebrow off. The wound was not considered dangerous, but the next day the injured man complained of "sickness all over" and a dull pain in his head. He grew steadily worse until about a week after the trouble, when he fell dead while drinking a glass of water. Soon after death his body turned yellow, with black spots—symptoms, according to the medical practitioners of the place, resulting from the poisonous condition of the biter's teeth.

HOW TO SECURE OLD AGE.—An old Quaker, William Klinkerbeard, died about 1753, at Plymouth, N. J., aged 108. At the age of 107 he hoed in the garden with a young man on a very warm day. On finishing the work the young man threw off his coat and the old man instead put on a buckskin jacket, saying: "Ah, my boy, that is the way you shorten life, throwing off your coat when you are warm, while I put on mine." He was healthy in body and mind, and rode out when past 107 years of age.

ANOTHER REMEDY FOR NEURALGIA.—A Frenchman has discovered that a stream of water directed from a force pump against a spot visited by neuralgia will relieve it. The operation is painful, but patients "call for a repetition on a return of the disease."

GREEN LAMP SHADES.—At Bonn, Germany, headaches, dyspepsia, etc., affecting several patients, have been traced to evening studies pursued under the baleful influence of a green lamp shade, from which arsenic was set free by the heat of the flame.

DOMESTIC ECONOMY.

The Omelet.

How to Make a Good One.

We think our readers will sincerely thank us for the precise mode of preparing this delicious luxury, for the mind that invented the omelet was capable of greater things. Many persons think they have made and eaten omelets when they have not. Anything that is made of eggs stirred up and solidified over the fire is supposed to be an omelet, but it is not. I have heard of people who put flour in it. Flour takes 15 or 20 minutes to cook, and an omelet is made in one minute; and raw flour is not wholesome or appetizing.

The true omelet is a pile of terror-stricken eggs and milk; it trembles with every jar, and crouches in a delicious quivering mass upon the plate; he who puts a silver knife into it will find a porous, flaky material, almost impalpable to the touch, that will melt as quickly as a snowflake in his month. Upon reflection, he will be willing to admit that hens were not made in vain.

Proceed in this way if you wish to make an omelet: Have some fresh eggs, not omelet eggs. All eggs that will not by any possibility do to boil, are put away in restaurants to make omelet with. Break them into a china bowl. If they are fresh, the white will be as clear as a maiden's eye, and the yolk as round as the pupil of it. Add a tablespoonful of milk for every egg, and whip the whole as thoroughly as you would for sponge cakes. The omelet pan has previously been put on the fire and made so hot that butter will melt and almost brown in it, but not quite. When in this condition you are to turn the whipped egg and milk into the pan and put it directly over the fire. Get a thin-bladed knife and run it carefully under the bottom of the egg, so as to let that which is not cooked get below. If the fire is right the whole mass will swell and puff and cook in a minute; if it is not carefully attended to it will burn on the bottom, and burned egg is most offensive in smell and taste. It is not necessary to wait until the whole mass is solid, as its own heat will cook it after it has left the pan; but begin at one side and carefully roll the edge over and over until it is all rolled up, and then let it stand for a moment to brown, and turn it out on a hot plate and serve it, or, what is better, eat it yourself—immediately.

You must not pat one grain of salt in it while cooking, or all your hopes and your omelet will flatten down together. If it is properly made it will be like a summer sunset, rich with crimson and yellow hues, and the savor will gladden the heart.

The common mistake in making omelets is to merely stir the eggs with a fork; to put no milk in it; to put salt, flour and bread crumbs in; to cook them too slow, and to turn them out on cold plates, a clammy, skinny waste of eggs. Thus made, they are as unwholesome to eat as they are repulsive in appearance.

If any one has a fancy for mixing finely minced ham with the egg batter, they will have a ham omelet; or for surrounding it with stewed kidneys and smearing a little of the sauce thereof about the egg after it is cooked, they will have a kidney omelet, or by pouring run over it and setting the same on fire, they will have an "omelet au rhum"; or by sprinkling granulated sugar over it it will be an "omelet sucre"; but all these are simply inventions of the enemy to see how vilely they can ill-treat a good thing, and yet not utterly ruin it.

YELLOW PORK.—Pork sometimes presents a yellow appearance when it comes from the slaughterer's. Such appearance is due to a derangement of the liver—to a deposit of vitiated bile. It is analogous to what often occurs in the human family, and is one of those cases where slaughtering saves the life of the animal, as it would soon have died of the jaundice if it had been left alone. To use such meat as food may possibly do nobody any hurt, but it is better suited to be used for soap grease.

The cause of streaked butter is the imperfect working of the butter after it is salted. Salt in butter sets the color, or deepens and brightens it; so that if the salt is worked into the butter and not so fully worked as to salt every part, then the fresh butter retains the color it had when it came from the churn, and the salt butter grows so much darker that it is decidedly streaked. The remedy is to work the streaked butter more thoroughly.

BANLEY BROTH.—Take a breakfast-cupful of pearl barley, boil it in a gallon of water gently for thirty minutes, then take three pounds of meat—lamb or mutton chops, with the fat cut off, or lean beef—put them into a separate stew-pan, dress them with a small quantity of water, add to them any kind of vegetables—carrots and turnips, with small onions, celery, and green peas, if in season—salt, pepper, and, with the water and the barley let the whole boil gently for two hours or longer, and serve it up all together.

PEA SOUP.—After well washing one quart of split peas soak them for the night, and boil them with a little carbonate of soda in just sufficient water to allow to break to a mash. Then put them to three or four quarts of beef broth and stew for one hour; then pass the whole through a sieve and heat again. Season with salt and pepper.



W. B. EWER, SENIOR EDITOR.

DEWEY & CO., Publishers.

A. T. DEWEY, GRO. H. STRONG
W. B. EWER, JNO. L. ROONEOffice, No. 224 Sansome St., S. E. Corner
of California St., San Francisco.

Subscription and Advertising Rates:

Advertising Rates—1 week. 1 month. 3 months. 1 year.				
Per line.....	25	80	\$3.00	\$5.00
One-half inch.....	\$1.00	3.00	7.50	24.00
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SAMPLE COPIES.—Occasionally we send copies of this paper to persons who we believe would be benefited by subscribing for it, or willing to assist us in extending its circulation. We call the attention of such to our prospectus and terms of subscription.

THE ORIGINAL ARTICLES in this paper are mostly set in solid type, giving in our columns one-third more reading than is contained in ordinary leaded matter.

San Francisco:

Saturday Morning, Feb 19, 1876.

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MORE INFORMATION.

During the coming season we intend to send out correspondents who will not fail to report promptly to us information of the most important improvements in the different districts they visit. This will make extra expense to us, and we trust to a liberal patronage of our improved reading columns to recompense us for the outlay. We expect the mining and mechanical industries of this coast to make great advancement this year, and we mean to improve fully the field of usefulness thereby open to the Press. We invite all interested in the progress of these industries to give the paper their support and send in their subscriptions and renewals without waiting to be called upon. Send at once by registered letter, or coin package by express, at our expense for transportation. We specially need the power of hard coin rightly due us, just now, to speed the Press onward!

The January product of the Belcher mine was \$325,500. A handsome surplus was carried over from the last dividend.

Incorporated Mining Companies.

Few people have any idea how many mining companies there are incorporated on this coast every year. We give each week in the Press a list of these incorporations, with the location of the property, capital stock, names of directors, etc. These companies are incorporated with a capital stock of from \$1,000,000 to \$10,000,000, the latter being the favorite figure now-a-days. To the uninitiated it would appear as if we had unlimited capital to invest in mines when so many companies are organized with such enormous capital to back them.

Unfortunately, however, this capital is only on paper, and a company with ten millions capital stock may be so hard up as to be unable to pay for the printing of the certificates which constitute its only available assets.

During the year 1875 there were 203 companies which filed certificates of incorporation in this city. The mines were mainly in Nevada, but some were in California, Idaho, Utah and Arizona. The par value of the shares is generally placed at from \$10 to \$100; but if the \$100 shares can be sold for \$5, or the \$10 shares for 25 cents, the promoters consider themselves in luck. Certain persons of some prominence in the community receive a certain number of shares free for the use of their names in incorporating, and further than this they seldom know anything of the property. Of course one or two interested parties or original owners are on the Board of Trustees. The manner of incorporating is simple, and is as follows:

The parties interested in a piece of mining property being desirous of forming a joint stock company, meet and adopt a name for the company. They then prepare in due form a certificate of incorporation, which sets forth the location of the claim, the intention of the company, names of trustees, amount of capital stock and its par value; this being signed and acknowledged is filed with the Clerk of the County Court in the county in which the principal place of business of the company is located. A certified copy is sent to the Secretary of State, and the parties owning in the mine then convey to the company all their interest in the mine and receive a certain proportion of stock for the same. The proper officers are then elected, the books opened and the stock issued. The institution is thus fairly afloat, either to become a permanent paying fixture, or to subside and die suddenly out. Its existence depends, however, more on the exertions of the promoters in disposing of the stock at "hedrock" prices than in the value of the property itself.

Although liable to abuse, the best method of working and managing the financial affairs of a company is by incorporation, as it facilitates business, enables parties interested to buy and sell or borrow upon their interest in the mine, and in various other ways brings undoubted benefits with it. For the facilitating of business, the collection of assessments and the general system of conducting the affairs of a company there is nothing like an incorporation. But the great trouble appears to be that many have conceived the erroneous idea that the simple form of issuing stock must necessarily give value to the mine it represents, losing sight of the fact that stock of any kind which does not pay dividends is substantially valueless. This public who buy the stock are gullible enough, however, to buy stock at what is known as "hedrock prices" without inquiring or knowing much of the property itself, trusting entirely to an advance in the price of stock for a profit. There are, however, hundreds of companies incorporated which are never heard of after the names appear as "New Incorporations." The system is the only one yet devised by which money can be raised for working small properties and in which each interested party is liable to loss or profit in proportion to the amount of stock he owns.

Latest from the Emma Mine.

There has been newspaper mention lately of a strike in the Emma mine. A private letter to a gentleman in this city, from a correspondent at Alta, Utah, furnishes the following information in respect to it and the character of the ore: A body of ore has been found in the Bay City tunnel which runs under the extreme westerly edge of the Emma mine workings, and is at least 400 feet west of the lower works. The tunnel level is 20 to 30 feet below said lower works. Ore found in the tunnel is poor; it assays from 3 64-100ths ounces to 15 79-100ths ounces per ton, with one to two per cent. lead. The superintendent calls that the average.

The ore body is continuous easterly and westerly as far as explored, say 20 feet each way, but it does not rise; in fact, it was found in the floor of the tunnel only, the roof being solid country rock. Vein matter seven to nine feet thick, with the mineral in seams and bunches.

The main shaft of the Rising Star mine, at Colfax, is now 580 feet deep and workmen are engaged on a contract to sink it to the 600 foot level. It is now the deepest mine in the county.

At San Diego a few days since a miner named Burns shot and killed one Jones of Silver City, Nevada, for having jumped a mining claim.

Facts from the Patent Office.

Number of patents issued by the United States Patent Office, to residents of the different States, Territories and foreign countries, from January 1st, 1875, to December 31st, 1875:

The proportion of patents to population is shown in last column.

State, etc.	No. of Patents.	One to every
District of Columbia.....	214	615
Connecticut.....	708	751
Massachusetts.....	1,846	787
Rhode Island.....	229	943
Colorado Territory.....	35	1,107
New York.....	3,771	1,153
California.....	399	1,404
New Jersey.....	655	1,534
Pennsylvania.....	2,034	1,728
Illinois.....	1,035	2,313
Ohio.....	1,091	2,443
New Hampshire.....	127	2,506
Vermont.....	122	2,709
Delaware.....	44	2,841
Michigan.....	405	2,923
Maryland.....	260	3,003
Minnesota.....	146	3,011
Nevada.....	15	3,393
Wisconsin.....	284	3,743
Idaho.....	315	3,790
Maine.....	158	3,954
Indiana.....	378	4,452
Oregon.....	22	4,631
Dakota Territory.....	3	4,727
Missouri.....	352	4,754
Arizona.....	2	4,829
Wyoming Territory.....	68	5,521
Nebraska.....	22	5,883
Texas.....	118	5,939
Louisiana.....	103	7,057
West Virginia.....	48	9,209
Kentucky.....	132	9,303
Montana Territory.....	4	9,974
ennessee.....	101	10,765
Virginia.....	8	12,130
Washington Territory.....	3	12,716
Idaho Territory.....	1	14,939
South Carolina.....	46	17,513
Georgia.....	63	18,795
Utah Territory.....	5	19,916
Mississippi.....	38	21,787
Florida.....	37	26,821
North Carolina.....	37	28,956
Alabama.....	31	32,161
New Mexico Territory.....	3	37,101
Arkansas.....	11	44,042
U. S. Army.....	5	
U. S. Navy.....	1	
Total for U. S.....	15,698	2,412
To subjects of foreign governments.....	690	
Aggregate.....	16,288	

RECAPITULATION.

Issued to citizens of—	
United States.....	15,698
Canada.....	150
Other subjects of Great Britain.....	221
France.....	31
Other foreign countries.....	123

Aggregate.....	15,288
Number issued in 1874.....	13,599
Increase over 1874.....	2,689

PATENTS EXPIRED.

Number of patents expired during the year 1875.....	579
Number of design patents expired during same time.....	752
Whole number of expirations.....	1,331
Less number of extensions granted.....	38

Leaving the actual number expired..... 1,323.

The *Scientific American* makes an analysis of the table, which shows some interesting facts. The geographical distribution of inventors to whom patents were granted in 1875, appears by it to be as follows:

To the six New England States there were issued 3,188 patents, being one to every 1,094 people.

To the seven Middle States (including Delaware, Maryland and West Virginia) 7,905, one to every 1,623 people.

To the nine Western States (including Missouri) 3,076, one to every 3,360 people.

To the 12 Southern States, 814, one to every 13,279 people.

To the three Pacific States, 437, one to every 1,699 people.

To nine Territories, 59, one to every 12,303 people.

And to the District of Columbia, 214, one to every 615 of population, being the highest ratio in the Union.

All the States and Territories have held their own, or made gains over 1874 in the number of their patents, save the following, which show losses: Alabama, Arkansas, Florida, Georgia, Kansas, Mississippi, Nebraska, Oregon, Vermont (for a wonder), and Dakota, Utah, Washington and Wyoming Territories.

New Hampshire and Nevada remained stationary, the former having 127, the latter 16 patents, the same as in 1874.

The principal increase was made in the following States: New York, 936; Pennsylvania, 390; Massachusetts, 340; Illinois, 164; California, 98; and the District of Columbia, 69.

The Rainfall.

As we have just passed through a time of liberal and general drenching, we compile from our interior exchanges a schedule of the total rainfall for the season to February 12th, at the places mentioned.

Colusa, Colusa county.....	12.85	inches.
Grass Valley, Nevada county.....	45.43	"
Petaluma, Sonoma county.....	18.15	"
San Rafael, Marin county.....	30.30	"
Sonoma, Tuolumne county.....	40.00	"
Vallejo, Solano county.....	12.43	"
Oakland, Alameda county.....	21.93	"
Livermore, Alameda county.....	14.58	"
Napa, Napa county.....	18.43	"
Martinez, Contra Costa county.....	14.64	"
Shasta, Shasta county.....	60.96	"
Lak port, Lake county.....	22.50	"
Los Angeles, Los Angeles county.....	21.88	"
San Luis Obispo, San Luis Obispo county.....	20.52	"
Weaverville, Trinity county.....	35.64	"
Nevada City, Nevada county.....	43.51	"
San Francisco, San Francisco county.....	22.79	"
Stockton, San Joaquin county.....	13.96	"
*And 67 inches of snow. †Up to Feb. 9th.		

The Dip of the Comstock.

Our attention has been called to a kind of pamphlet which has been widely distributed, and headed "The Great Comstock System of Mines," by W. Frank Stewart, in which the author appears to wish to convey to the public the idea that he was the first person who discovered the true course and dip of the Comstock lode. Now, the first report that we remember by any mining expert, on the Comstock lode, was made in October, 1859, extracts of which appeared in the *Sacramento Union*, November 10th of that year. In that report the lode is described as dipping to the eastward. In our issue of February 23d, 1863, we referred to this fact.

If Mr. Stewart knows anything of the history of the Comstock he will recollect when the one-ledge theory was started, in the snit of the Ophir & Burning Moscow, and what was then said about the dip of the lode. We do not understand Mr. S. when he speaks of the selvages and clay seams. The latter term is generally used by miners to represent a stratum whose normal position is horizontal. Mr. S. talks of a broad belt of porphyry, inferring, as we understand him, that the country back of the Comstock lode is composed of that character of rock. As Mr. S. professes to know something of lithology we should be glad if he would inform us to which class of volcanic rocks porphyry belongs—acidic or basic? We never heard any miner of standing say that the Comstock lode bifurcated in the way Mr. S. states.

If we mistake not Mr. S. published something in one of the Virginia papers about the telluride of silver forming a large proportion of the ores of the Comstock. The University of California and the Academy of Sciences would, we should think, be glad to get specimens of such ore from the Comstock lode. In Mr. Stewart's pamphlet this reference to the "theological structure of the Comstock lode" is probably a curious typographical error.

DEATH OF DR. LOGAN.—When the month of January closed we wondered why we did not receive our customary advice of the rainfall in Sacramento from our esteemed contributor, Dr. Thomas M. Logan. We were not long in doubt, for tidings came of the death of the gentleman whose life is so inwrought with the life of the State. He died on Saturday night last after an illness of three or four weeks. Dr. Logan was born in South Carolina, his father being a prominent physician. In 1828 he graduated from the medical college of that State, and in course of time entered into the practice of his profession at New Orleans, from whence he came to California in 1849, locating at Sacramento. Even in those early days, when everything in the State was in a chaotic condition, and few people cared to do anything that was not to be rewarded promptly with gold, the doctor began keeping the records of the thermometer and barometer, rainfall, health statistics, etc., which he carefully continued until his late illness, and which have been so valuable that his figures and notes have been extensively copied not only in the United States, but throughout Europe, and caused him to obtain a very enviable reputation. At the time of his death he occupied the chair of professor of hygiene in the medical department of the State University, was secretary of the State board of health, of which he was virtually the originator, and also secretary of the board of health of Sacramento; a prominent member of the State medical society, which he did much to reorganize a few years ago; president of the Agassiz institute of this city; an honorary member of the medical society of Vienna, etc. In 1873, at the 24th annual session of the American medical association, in St. Louis, he attended as a representative from California, and was honored by being elected president of the association. His love for science extended to its twin sister, art, to which he paid much attention. As a medical practitioner he was successful and popular, and in all his relations with society he was held in the highest esteem. His age was 68 years.

THE COCHRANE ORE FEEDER.—The Cochrane ore feeder, recently illustrated in the Press, is meeting with great success. Messrs. Hendy & Cochrane, manufacturers, No. 32 Fremont street, show us several letters from different parties using these feeders, in which they are highly praised. Mr. C. C. Belding, of Drytown, Placer county, says that he "does not see how it is possible for anything to work better than those he has in his mill." They are attracting considerable attention there. The 10-stamp mill is crushing 20 tons per day through a No. 6 screen. Mr. Aug. H. Schmahel, of Newcastle, Placer county, says: "The feeders work splendidly, and are just the thing wanted in all mills. In the first place I think more rock can be crushed by their use; in the second, they save screens; in the third, they operate so that the gold is saved better; and fourth, it saves wages. You are never bothered to get good feeders, for they are always right there on hand, and as long as you keep them full and properly set they will do their work."

SINKING on the main shaft of the Raymond & Ely mine was resumed on the morning of the 10th inst.

Hydraulic Gold Mining in California.

(No. 8.—Written for the Press by C. J. Brown.)

The Franklin Gravel Mining Company.

This company is a California corporation, with its principal place of business at the city of San Francisco. Its capital stock is \$2,000,000, in shares of \$100 each.

The present directors of the company, I believe, are J. D. Fry, O. F. Griffin, R. N. Graves, Jos. Sharon and C. A. Booth.

The ground owned by this company lies to the southwest, or down the channel from the Southern Cross, with the Bear River Hill and the Queen City claims intervening, (which latter aggregate a strip of ground about 400 feet wide,) and extends from the southeast rim rock to near Bear river, and is known as the Franklin claim; it has an area, I am informed by the Superintendent, of 45 acres. It was owned and worked for many years by Mr. Jas. Teaff, a veteran hydraulic miner of this place, who still retains an interest as a stockholder in the company, and who is now its superintendent. Mr. Teaff came here a young man in the prime of life; he was reared to a life of usefulness as a practical mechanic, and is a man of stern integrity, probity and honor, a steadfast friend of the laboring classes in all departments of industry, and, were I now to write his obituary notice for the future, I could not say less, nor possibly more than: "Here lies the earthly casket of a man who, in adversity as well as prosperity, rendered unto the laborer his hire to the utmost farthing." He is public spirited and sympathetically philanthropic, even to a fault; the needy and the unfortunate find in him a friend indeed, and he is ever on the alert to alleviate suffering and lighten the burden of the lowly and oppressed; he is an energetic worker and never flags in the prosecution of any enterprise he espouses, but, with nothing but zeal, pursues the course and line of work first determined upon, till its final completion. He is more a worker than a thinker, and being extremely self-reliant, is consequently more liable to err in judgment than fail from lack of energy. The mining interest of this district is, in great measure, indebted to Mr. Teaff for his constant exertions to demonstrate its great value and bring our bottom gravel mines prominently before the public at a time when by draining the top bench of gravel had nearly ceased, which has finally resulted in such an investment of capitals as to insure its complete development.

Mr. Teaff, with his partners, commenced work on the Franklin ground in A. D. 1854; afterwards becoming sole owner, he went forward and ran a gravel tunnel 1,700 feet in length.

I am informed by Mr. T. that this tunnel (which is now unused,) with its full complement, cost him the sum of \$55,000, and that prior to A. D., 1870, the claim had paid, for water alone, the sum of \$145,000. He estimates that up to that time there had been extracted therefrom the sum of \$300,000.

The Dutch Flat Blue Gravel Mining Company.

A company incorporated under the above name purchased the Franklin claim of Mr. Teaff in A. D., 1871, which, under the superintendency of Mr. Dorsey, of San Francisco, went forward and erected thereon a superb hydraulic rigging, consisting of 3,500 feet of iron pipe, constructed from No. 8 to No. 16 sheet iron. This pipe, which is yet an apprenticeship to the ground, is five feet in diameter at the head and 22 inches at the tail thereof, its pressure is given under a fall of 465 feet, and it has a capacity of about 3,000 inches of water. This company was, for numerous good and sufficient reasons, unsuccessful, consequently in 1875 the entire property fell into the hands of the Franklin gravel mining company, which thereupon contracted with Mr. Teaff to run a bed-rock tunnel six feet wide and eight feet high through the northwestern rim into the gravel bed. Mr. T. has completed 400 feet of the tunnel, at an expense of \$30 per linear foot, which is as cheap as any miner may expect to excavate a tunnel of that dimensions in the rock along this channel. The head of this tunnel is 68 feet below the surface of the rock, and 148 feet below the top of the gravel, giving an 80 foot gravel bank. A perpendicular shaft has been sunk through the gravel and part way into the rock, meeting an incline raised on an angle of about 80 degrees from the head of the tunnel. This work has all been done by hand power, and the tunnel, which debouches into the canon of Bear river, is run on a ten inch grade to twelve feet, and is a splendid piece of work. The head-sills for the flume were laid in the rock as the work advanced and a four foot flume will have been placed therein before the publication of this letter; 384 feet of similar flume, on the same grade, provided with three under-currents, has already been constructed from the mouth of the tunnel along the steep hillside, where, from the nature of the surface, Mr. T. was compelled to excavate a bed for it in solid rock. This company, when the pit is fairly opened, will require and use, if obtainable, from 1,000 to 1,500 inches of water.

In No. 3, published in the Press of the 11th of September last, I asserted that the deep channel crossed under the southern (more

correctly south-eastern) portion of this Franklin claim. No one familiar with the ground doubts the correctness of this assertion, consequently I assume that the head of this bedrock tunnel is at least 1,000 feet to the north-west of the center, and high above the bottom of the main channel which the claim covers, and the gravel which is to be washed through it lies along the inner slope of the rim rock dipping to the head of the channel, toward which it could be washed with great facility if the claim should be opened through a tunnel deep and long enough to reach the lowest depression in the rock. Such a tunnel could not be much, if any, less than 2,000 feet in length, and would cost, at present rates, the sum of \$80,000. The claim covers about 750 feet in length of the deep channel. No drifting has ever been done thereon, but the ground has been prospected by means of shafts, sufficient to justify us in saying that it is as rich as any situated on the Dutch Flat channel. The gravel—including a 40 or 50 foot stratum of trap slide—is about

enterprise is, at best, of but temporary use, and the expenses are too great when compared with the amount received; the greatest loss lies in the fact that in a short time the major part of all the capital invested becomes a dead loss; while on the other hand, a deep tunnel like the Cedar Creek, the Southern Cross, and the Polar Star companies are respectively completing, is a permanent improvement, and for all time till the mines are completely exhausted.

I have no doubt that eight or ten feet of the bottom of the bank where the company is now operating will pay better to mill than to hydraulic, but building a mill upon this high rim rock would be a repetition of the folly of Tom Jefferson—or some other man—who once built a wind-power saw mill on the summit of a high hill, and demonstrated the fact that the cost of getting his logs to mill exceeded the value of his manufactured lumber. I would be gratified to see the Franklin imitate the other companies I have mentioned and proceed to run a deep tunnel; if the area of its claim will



LOWER FALL OF THE YELLOWSTONE RIVER.

225 feet at the deepest, and will probably average on the whole 110 feet deep.

Whether any one claim located along this Dutch Flat channel will justify being worked at present, depends largely, in my opinion, upon its size and its special location, and the facility and rapidity with which the gravel and debris can be removed. The Franklin may hydraulic off a bench of the high wash along the rim with a highly satisfactory result, but it could be sluiced through a deep tunnel with greater ease and the dirt be used (as it is all greatly needed for such purpose) to help remove the heavy bottom boulders. In my opinion, if this company is justified in mining its claim as a separate undertaking, independent of any other company, it must have its justification upon the completion, in the first instance, of a deep bed-rock tunnel, long enough to tap the lowest depression in the channel, and from thence open up its ground from top to bottom.

I have no faith in the policy of washing a top bench with the view of obtaining capital to develop the bottom. The work done in such an

not justify, let it purchase the Queen City and the Bear River Hill claims adjoining the Franklin on the northeast, which will give it about 400 feet more in length along the main channel, and the Boston claim which adjoins on the southwest; though this latter claim covers little or none of the deep channel, it is, nevertheless, a valuable piece of ground, and would be of great benefit to the Franklin in the event of its working through a deep tunnel.

Dutch Flat, Feb. 14th, 1876.

The mills on Carson river are all running to their full capacity, and as there has been plenty of ore constantly on hand, no stoppages have been made on account of the snow blockade. There is plenty of water in the river, and no difficulty is experienced now, as there was earlier in the season, from the freezing up of the water-wheels.

LARRY CRONIN, the miner who was injured a few days ago in the Dayton mine in Virginia City, by being crushed under the cage, died of his injuries on Friday last.

The Yellowstone Falls.

At the head of the grand canon is the lower fall of the Yellowstone, which is 397 feet in height; at the foot of the fall the depth of the canon is 675 feet. The center of attraction is the lower fall, which is illustrated on this page. Prof. Hayden, in his "Geological Survey of the Territories," thus describes it:

"The river suddenly narrows to a width of only 100 feet and rushes over a ledge of trachyte, falling 397 feet to the bottom of the canon. The water at the edge of the fall is very deep and of a deep green color. Huge boulders thrown in are carried by the force of the current far out from the edge of the fall. When we approach the brink and look over into the abyss we begin to realize the littleness of man when in the presence of nature's grand masterpieces. Down, down goes the whirling mass, battling and writhing as the water dashes against the rocks with a noise like a discharge of artillery. Here and there a resisting rock is met with and the water rebounds, broken into myriads of drops, which throw back to us the sunlight resolved into its primitive colors. The bottom of the canon reached, the immense mass of water seems to dissolve itself into spray, and then recovering, it flows down the gorge an emerald-green stream, dashed with patches of white, heaving with furious waves the rocky walls that imprison it. Taken in connection with the varied tints of the canon itself, red, yellow, orange, white, the dark-green pines fringing the top, and the bright green of the spray nourished moss on the sides of the fall, we have a picture of almost unequalled magnificence and grandeur. It is a scene of which one never tires and in the description of which language fails."

RICH ROCK.—We were shown, to-day, a specimen of chloride ore from a lot of ten tons just reduced at the Manhattan mill, which was extracted by Louis Schoff from the Sagebrush mine, Yunklee Blade, two and one-half miles distant from Austin. The specimen is a special piece intended for presentation to the cabinet of the Society of Reese River pioneers, and is very rich, being all chloride and horn silver, and will probably assay far up into the thousands. The lot worked at the mill gave an average result of \$476 per ton, the first working \$2,064.14; second class, \$615.75; third class, \$210.50. The ore was discovered in the grass roots, while the discoverer was pulling sagebrush with which to build a fire. With such bonanza as this lying around loose right at our very doors, the Black Hills sink into insignificance.—Reese River Reveille.

JACOTINGA.—In the London Mining World of January 22d we find a report of the Don Pedro North del Rey mine, Brazil, in which it is stated that the loss of gold in working their vein stone jacotiga (micaceous specular iron ore, with which the gold is mechanically combined), was 18 per cent. of the original contents, the original gold contents being about \$46.50 per ton. The separation of gold from the jacotiga is a difficult process, much more so than when it is mechanically combined with pyritic matter. We have never met with any of this class of ore in any vein on this coast; at least one-third of the gold from Brazil has been obtained from that character of vein material.

THE FIRST SHIPMENT.—The Winnemucca Silver State says that the Eagle mill and mining company of Lewis district, near Battle Mountain, have made their first shipment of bullion. It consisted of two bars, valued at \$4,000. The company have had some trouble with the roasting furnace attached to the new mill. The Deference mine, owned by the company, has been reckoned among the best in Central Nevada, and it is undoubtedly entitled to that consideration. A year ago, while the mine was being prospected, a car load of the ore brought to the Humboldt reduction works by C. W. Frasier yielded over \$500 per ton.

GOLD IN ALASKA.—M. P. BORRY, collector of the port of Sitka, Alaska, in a communication to Secretary Bristow, dated January 18th, says: One member of a small party of prospectors arrived at Kobuk during the month of September and stated that himself and party had been mining on one of the branches of the Kenai river. They made from \$4 to \$6 per day, coarse gold; no bedrock reached. They could not state whether there were extensive diggings or not, as they had to leave on account of health.

MORE trouble is being experienced on the track of the Virginia and Truckee railroad at a point a short distance east of Fort Homestead, by the settling of the ground under the track. It is the same place at which so much trouble was had a month or two ago. Again they are filling in the sink with waste rock. The settling of the ground does not interfere with the regular traffic of the road.

A CYLINDER for the steamer Yosemite was successfully cast at the railroad foundry, at Sacramento, Friday. It is 57 inches in diameter and 11 feet stroke. It is the largest casting ever made in that city.

On Monday night Peter O'Neil was killed by a blast in the Champion mine, on White Pine mountain.

English Built Steamers for the Pacific Mail S. S. Co.

The mail contract between the government of New South Wales and the Pacific Mail company is for eight years, and the amount of the subsidy annually is £90,000. The company intends to place on the route three steamers—the *City of San Francisco*, the *City of New York* and the *City of Sydney*. Between Sydney and the Fijis, and New Zealand, English steamers will carry the mails, and the following extract from the *Illustrated London News* shows that these vessels are completed, and that one has sailed:

The dimensions of the *Australia* are: Length, 376 feet; beam, 37½ feet; depth from base line (bottom of floors) to spar deck, 28 feet 8 inches; depth of hold from top of floors to main deck, 19 feet; tonnage, about 3,000, British measurement. The engines, of 500 horse-power, nominal, working up to 2,400 horse-power, effective, are compound, with two cylinders of 62 inches, and one cylinder of 45 inches in diameter; stroke, 4 feet 3 inches. They take three grips of the crank shaft, instead of two, as is usual in marine engines, and the result is a steady, quiet movement, almost inaudible in the saloon, even when the engines are working at high pressure.

The sleeping cabins for the first-class passengers are of a very superior character, most of them being placed on the main deck, forward of the spacious dining saloon. A number of staterooms on the upper or hurricane deck are arranged for two passengers only, while a few are admirably adapted for families. They are covered by a light and elegant deck, affording an elegant promenade for passengers during the day-time, and projecting sufficiently over each side to provide an awning for the cabins and a roomy sheltered walk. The windows and venetian blinds, with which these cabins are fitted, must make them exceedingly light and airy. The dining saloon is very handsome, extending across the ship from side to side, with four tables running fore and aft the entire length. It measures sixty feet by thirty-eight feet, with sixteen inside ports, and is lighted and ventilated by a lofty, dome-shaped skylight, which is one of the most striking features of the ship. Contrary to custom, the saloon is placed forward of the funnel, thus escaping the smoke and heat from the engine-room. The *Australia* has accommodations for 164 first-class, 24 second-class, and 85 third-class passengers.

The *Australia* and her sister ship *Zelandia* were built especially for the Australia and San Francisco service by John Elder & Co., Glasgow. The *Zelandia* sailed from Plymouth for Melbourne on the 19th of December, and was spoken at St. Vincent, Cape de Verde island, on the 28th of the same month, having made the run in eight days and seventeen hours, being an average of 12 nautical miles an hour. She was expected to make the voyage to Melbourne comfortably in 43 days.

The South Chariot Mine.

The editor of the *Owyhee Avalanche* has made a visit to the South Chariot mine and speaks very flattering concerning it. He says: "About 32 miners are now employed in this mine, and the company's 10-stamp mill is being kept running on ore extracted from between the 6th and 7th, the 7th and 8th, and the 9th and 10th levels.

"Between the 6th and 7th levels they are now stoping at a point 450 feet north of the shaft, where the vein is from one foot to two and a half feet in width, well defined and producing splendid milling ore, with every indication of continuing as good up to the Minnesota line, 150 feet further north. This pay shute pitches down through the 7th, 8th and 9th levels at an angle which brings it within 115 feet of the shaft on the 10th level, where Superintendent Crutcher struck it by running a cross-cut some 24 feet from a drift which, for some unexplained reason, was run by a former superintendent through solid granite almost parallel with the ledge. On the 10th level the vein is larger and richer than in the levels above, the ore showing handsomely in silver interspersed with considerable free gold.

"From the foregoing it will be seen that in the South Chariot, north of the shaft, a rich ore body is known to exist in the shape of a trapezoid, whose upper and lower boundaries are 150 and 535 feet in length, on the 6th and 10th levels respectively. Allowing that the vein will average only one foot in thickness and reckoning 12 feet of solid quartz to the ton, we find that this body of ore will produce 10,552 tons, and, estimating that it will pay \$40 per ton (a low estimate), we have a net yield of \$422,080 from ore now 'in sight.' As this pay shute is found on the 10th level, as above stated, it is reasonable to presume it will also be developed in the 11th, and how much deeper, of course, no one can tell."

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

J. L. TRUMBULL—San Francisco.
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NOTICE.

Whereas, numerous persons have represented themselves as Agents of the FRYER PROCESS, the public are hereby notified that there are no authorized Agents. All business connected with the process must be transacted, until further notice, through the office of the FRYER NOBLE METAL MINING COMPANY, at Grass Valley, Nevada County, Cal.

I. ROBERT M. FRYER, Supt.

Mining Superintendent.

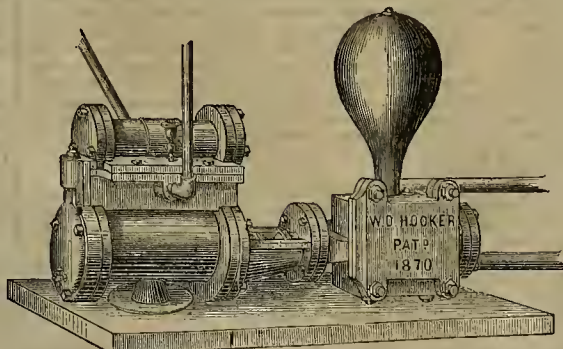
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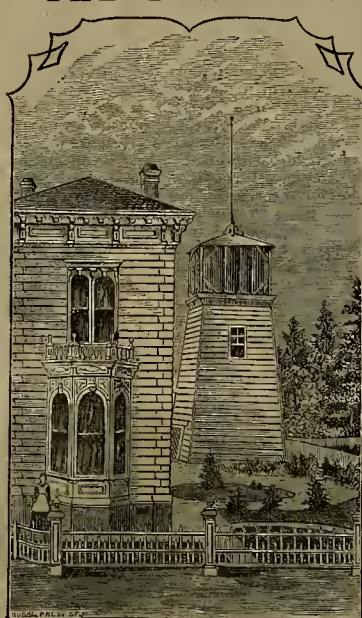
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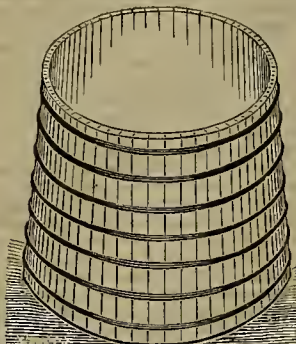
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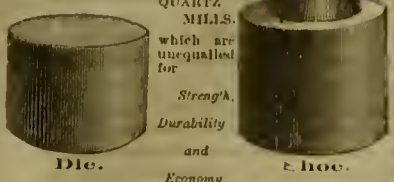
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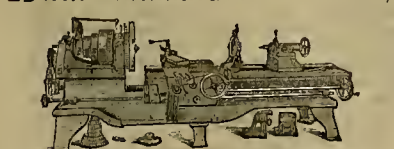


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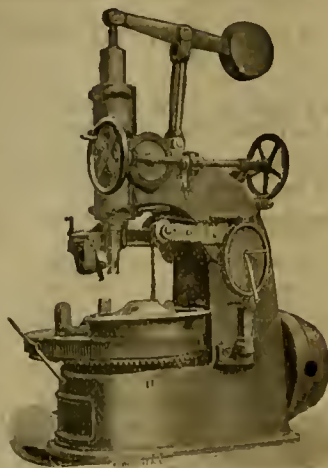
LATEST IMPROVEMENT. Double Treadle, including one doz. Saws, thirty immitable Fret Sawing Patterns and Prepared Wood to the value of \$4. A new device for tightening Saw, Power Drilling attachment. Wrench, Oil Cup and Driver. Speed, 800 strokes per minute. Saws 1 1/2 in. thick. Price, complete, eased and delivered on board cars or at Express office, \$12 SMALL STEAM ENGINES, With copper boiler, drive light Lathes, Scroll Saws, etc. 100 Scroll Work Designs, free on receipt of stamp. Address GEO. PARK, Buffalo, N. Y.

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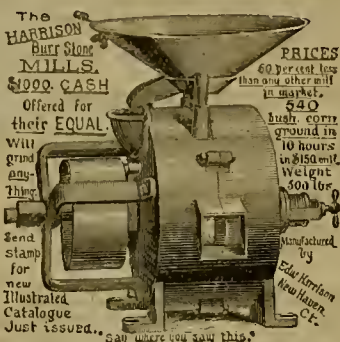
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"We started the heavy 20-inch Corn Mill last Friday you sent to Baldwin & Tabor, Manchester, N. H. We ran it most all day, and ground 60 bushels corn per hour. The mill you sent us at Haverhill, Mass., for A. S. Hook, is doing wonderfully. It is grinding on an average 2,500 lbs. good meal per hour, and has ground 2,800 lbs. in an hour. It is driven by an engine with a 2-in. cylinder, and takes the place of a 30 in. mill of another kind that, when doing its best and loading the engine with all it could carry, only ground 1,500 lbs. per hour. If there is a mill built that can beat that we would be pleased to see it brought out."

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MITCHELL'S New York Candles

Full Weight and 14 ounce.

Will be found on comparison to be

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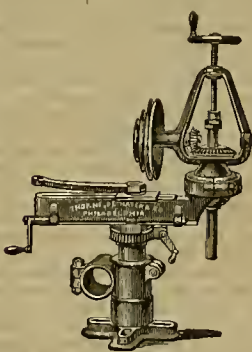
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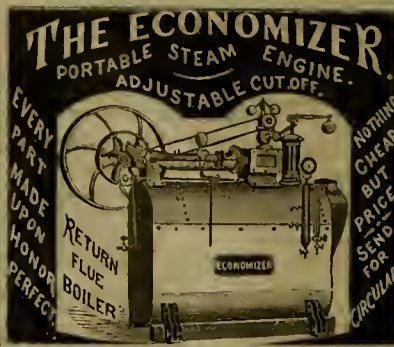
PORTABLE DRILLS. Driven by power in any direction, self-feed and convenient adjustment. RADIAL DRILLS. Self-feed—large adjustable box table—separate base plate, every convenience. VERTICAL DRILLS. Self-feeding—of new and improved designs. MULTIPLE DRILLS. For boiler work, etc., 2 to 20 spindles, fed and returned by power or hand, together or separately. HORIZONTAL BORING AND DRILLING MACHINES. For large pieces—with boring head, adjustable, vertically and horizontally. SPECIAL DRILLS. For special work. Gun Blank Drills, Coal Drills, &c., built to order.



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Barnes' Patent Foot and Steam Power Scroll Saws and Lathes.

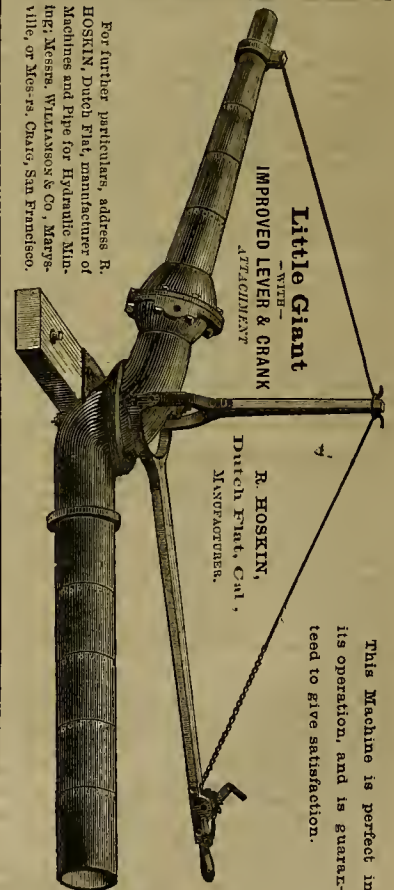
For the entire range of Scroll Sawing, from the finest ornament to the corner bracket, three inches thick. WARRANTY.—We warrant that a man with ordinary experience can, with this Foot Power Machine, saw through the following kinds of lumber line measure: Pine, 3 in. thick, 1 foot per minute; 1 in. thick, 4 ft. per min.; Walnut, 3 in. thick, 3 ft. per min.; 1 in. thick, 2 ft. per min. Address for full particulars, W. F. & JOHN BARNES, Rockford, Winnebago Co., Illinois.

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THOS. P. H. WHITELAW, 266 Brannan street, S. F.

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Merchant Tailors, Gents' Furnish'g G'ds, Bootmakers, Furniture Dealers, Hatters, Jewelers, Hotels, Piano Fortes, Wine Merchants, Etc., Etc.

Glasgow Iron and Metal Importing Co.

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WM. McCRINDLE, Manager, 22 & 24 Fremont St., S. F.

(Continued from Page 117.)

pump will be started into operation. Sinking the shaft deeper will be resumed as soon as practicable—probably day after to-morrow.

MEXICAN.—Sinking the winze below the 1465-ft level is making steady progress, the bottom still in fine appearing quartz.

MINT.—Putting in the several stations in the pumping compartment of the shaft is making steady progress. Sinking the main shaft is also making good headway. It is now down 1,015 feet.

MONUMENTAL.—The rock in the bottom of the shaft is quite hard, but blasts not well and admits of fair progress. The shaft is now down 75 feet. The sinking is being energetically pressed forward, and the shaft will soon have reached a depth at which it will be necessary to erect steam machinery. This it is the intention to do as soon as it is required.

NEVADA.—Considerable improvement is shown in the face of the main drift north, the streaks of low grade ore coming in wider and giving better assays.

NEW YORK CONSOLIDATED.—The east and west cross-cuts on the 800-ft level are each steadily advancing, with very encouraging prospects in the face of the west drift. The enlargement of the shaft is going steadily and rapidly forward.

NORTH CARBON.—The ore in the north drift is looking and promising finely, improving with farther advancement of the drift. A station is complete to open the 200-ft level, and sinking the main shaft deeper is resumed, as every development goes to show that only depth is required to find the ledge concentrated into a fine payable body.

NORTH CAROLINA VIRGINIA.—The pump station at the 630-ft level is completed and sinking the main shaft has been resumed. The bottom is in ledge material of a very favorable character, and it is confidently expected that the ledge will be cut by the shaft before reaching a depth of 1,000 feet, or 340 feet more than its present depth. The company has determined to press the shaft with all possible energy until a depth of 1,000 feet has been attained or the ledge struck; and then to open a number of levels at this same time.

OHIO.—Daily yield, 150 tons of ore. The ore breasts are all looking well and yielding ore of a good quality. Two mills, the Nevada and Empire State, are kept steadily at work crushing the ore, and had it not been for the snow and stormy weather interfering with the hauling of the ore, the Winfield mill would have been started up this morning. Clearing out and repairing the winzes and drifts below the 1600-ft level is making steady and favorable progress. The prospects in the east drift on the 1100-ft level are excellent.

ORIGINAL GOLD HILL.—Both raises in the south ore body continue in excellent ore, and the various breasts and stopes at the ore track level are looking finely. Ore extraction continues suspended owing to the dump being full and the roads in too bad a condition to allow of hauling the ore to the mill.

OVERMAN.—Sinking the shaft is making fair progress considering the hardness of the rock in the bottom. The prospecting drifts and cross-cuts, on the 1100-ft level, are all steadily pushed forward without any material change during the week.

RAN AND WATTS CROSS.—This is a double location, consisting of two claims, 2,000 feet in length, lying parallel with and adjoining each other, 450 feet east of the famous O. & C. shaft, Virginia City. The location is an old and very valuable one, with a fine looking ledge cropping out at the surface. Both claims are being conjointly worked by means of a three-compartment shaft, which is now being sunk on the division line between them. This shaft is now down 50 feet, and sinking is suspended for the purpose of timbering. Dr. James Delavan, a mining man of judgment and experience, is superintendent, and is pushing the work along industriously.

ROCK ISLAND.—Sinking the main shaft is making excellent headway. Prospecting the ore vein on the 650-ft level has developed no new features during the week.

SAVAGE.—This morning the water had risen to a point in the main incline 125 feet above the 1900 ft level, having risen yesterday 11 feet during the day. It is evident that the water in the incline has nearly reached the level from which the source springs, and is not therefore liable to reach a very much greater altitude. The pumps of the Savage and the O. & C. hoist the water at the rate of 26,000 gallons per hour, that being the full capacity of the pumps and water tanks. Designs have been drawn for large and powerful pumping machinery, which will probably be manufactured and erected in the shortest possible time.

SOUTH CONROCK.—Total length of cross-cut, 365 feet. The last 12 feet of it is in hard white quartz, heavy with sulphurets or pyrites of iron, and giving very fair assays in silver and gold. The drift passed through a thick and very favorable looking clay wall before encountering the solid ledge of quartz, which is evidently the main west vein which Superintendent Nelson has been drifting for so long. After passing through the clay wall, considerable water was met with, which increased rapidly with every foot of advancement, and has proven so troublesome the last five or six days, that very little progress has been made in drifting, the machinery having about all it could do to keep the water reduced. Some improvements are being made in this respect, however, and drifting can shortly be proceeded with.

SILVER NEVADA.—Sinking the main shaft is making steady progress, the bottom in excellent working ground. The south drift on the 1000-ft level shows no change during the week. The south drift on the 1250-ft level is steadily advancing, with no new important features to report. The north drift on the 700-ft level of the old shaft is also making steady progress, without change of interest.

SOUTH CARBON.—Clearing action has been made by the south drift mentioned in last week's report with the main ore stopes, giving good air circulation and an excellent outlet for the ore. The drift north from the upraise continues in high grade ore. Prospecting at all points goes forward systematically and effectively, and the dump is getting overladen with first-rate ore. Will start milling next week. At the annual meeting of the company, held last Monday, Mr. Morganthau, J. H. Helen, S. R. Palmer, J. P. Dyer and S. Heydenfeldt were elected directors for the ensuing year. S. Heydenfeldt was elected President, and A. K. Durbrow, Secretary. Sixty-two thousand five hundred and fifty shares were represented at the meeting.

SILVER HILL.—Sinking the main incline shaft below the fourth station level is making steady progress, the rock in the bottom working quite favorably. The work was commenced four or five days ago in the face of the main east drift on the fourth station level, but had to be again stopped on account of a strong increase in the flow of water. The water has decreased to a sufficient extent to again allow the men to resume work in the face of the drift this morning.

SILVER HILL.—The men again started up and the water drained from the bottom of the shaft. Sample of the ore taken from this ledge, recently struck in the bottom of the shaft, give average assays ranging from \$40 to \$200. No opportunity has yet been given for determining the width of the ledge and the extent of the ore body. Now that the shaft is again clear of water, some lively developments may be looked for. This ore vein is in an entirely new and unexplored range, and its further development is a matter of much interest to all the mines to the eastward of the Justice and Woodville, and the results will be anxiously looked for by many outsiders, as well as the direct stockholders of the Successor. The north cross-cut on the 550-ft level is also showing some very favorable looking quartz and ore. No change in the main west drift on the 550-ft level.

SULLIVAN.—The cross-cut east from the south drift is now in 45 feet, and being pushed ahead both night

and day, working three shifts of hands. The material being passed through is the same splendid looking vein matter heretofore mentioned. Some hard streaks are met with, but generally speaking it is softer and more favorable, with better ore streaks and indications than have yet been encountered at this level.

UTAH.—The water has been drained from the shaft to a point a little below the 500-ft level, and is being gradually reduced at the rate of 13 feet per day. The shaft is found to be in an excellent condition, so far having no need of any repairs whatever. The repairs to the drifts on the 400-ft level are gradually progressing, although it will take some time yet to put that portion of the mine in as good condition as it was before the destruction of the hoisting works.

UNION CONSOLIDATED.—The face of the cross-cut from the north drift on the upper tunnel level is still in clay and ledge material mixed. Sinking the winzes below the 1300-ft level is steadily progressing, the bottom of both in quartz and ore.

WEST BELCHER.—The steam hoisting machinery for this mine arrived yesterday, and will be put into working position as soon as practicable. As we have before stated the company have made full arrangements, under contract with the Overman mining company, to use the old Overman shaft, therefore the hoisting works are being erected at that shaft. By this means the West Belcher can and will be opened and worked in the most advantageous manner possible, at whatever cost a design from the shaft of 400 or 500 feet will be required to reach the fine ledge of pay ore already developed in the upper workings.

YELLOW JACKET.—The several cross-cuts and prospecting drifts on the 1940-ft level are steadily progressing in favorable looking material. Otherwise nothing new or interesting to report.

ELY DISTRICT.

RAYMOND AND ELY.—Pioche Record, Feb. 6: During the past year from 13,644 tons of ore have been extracted from the mine which has pulped \$75 per ton. Since the 1st of January quite a number of changes have been made in regard to working and extracting of ore. Numerous contracts have been let, some on the Burke & Creole which will return dividends to the company, it heretofore being almost dead work in these companies. The superintendent, D. M. Tyrrell, has let a contract on the main shaft, called the Lighter shaft, to several parties, the contract being to sink 125 feet at the rate of \$45 per foot, the company furnishing tools, timbers and agresting to keep the shaft dry. The contractors will start about Monday; in the meantime the company are busily engaged in cutting out for a station tank, which will be completed and everything in order by that time. The pump has now only to run 16 hours out of 24 to keep the shaft drained. The flow of water has not increased lately and the pump is working to the satisfaction of every one. The ore on the 10th level seems to be the best that has ever been struck in the mine, pulping \$150, so that the shipments of bullion for the month of February will largely exceed those of January.

ALPHE.—During the past week work has been continued on this mine with the same regularity as formerly. Work on the lower level is progressing slowly, owing to the hardness of the ground; progress, however, is satisfactory. In the upper portions of the mine the different drifts look well and continue to improve, they extracting from the same an average of 16 tons daily.

AMERICAN FLAG.—During the past week work has been commenced on this mine, a small number of men being placed on it, the time that it was idle being consumed in placing the machinery and hoilers in proper order. This has been completed and the work will go on as usual. We heard something of a strike being made immediately on the resumption of work, but could not trace it to any reliable foundation. The mill is expected to start in a very short time.

MEADOW VALLEY.—Owing to the recent storms the building to cover the hoisting works has not been covered over or planked up yet, but if the weather keeps as pleasant as has been for the last few days, before our next report we will see the things in proper shape. Work is still continued by chloriders. On the 1200-ft level running the north cross-cut, which is being advanced rapidly, the ore of a very fine and very satisfactory character and working well at the Newark mill.

PROBIE.—On the 1000-ft level the vein continues to gain in size and strength. The filling is pure quartz with seams of metal assaying well; the ledge, however, taken as a whole, gives assays of \$20. The formation is much more favorable and an early and substantial improvement is expected. Nothing new in the other workings.

PROBIE WEST EX.—Although no work is being done on this mine, the advertisement in yesterday's Record shows that the recommencement of work is not far distant, as the company is settling up back indebtedness for the purpose of taking a fresh start. Mike Holland now has charge of this mine.

PROBIE CONWAY.—The company is now working two shifts on the main shaft, running night and day. The shaft is now down in the neighborhood of 50 feet, and is just getting into vein matter, there being occasionally rich bunches of ore throughout the shaft. Are sinking at the rate of two and one-half feet per day.

ANTILES.—The main shaft is down 190 feet and the ground grows more favorable. The cross-cut will be commenced for the ledge at an early day.

GET THE BEST.—From all we can learn there is no better life insurance company doing business here than the **MUTUAL BENEFIT INSURANCE Co.**, of Newark, New Jersey. Its assets are over \$31,000,000. It is represented on this coast by Mr. James Munsell, Jr., whose office adjoins our own, at No. 224 Sansome street, San Francisco. Some of the best business men on this coast are carrying policies taken out for large amounts through Mr. Munsell, who has been the gentlemanly and active agent of the company for some years. We would call the attention of readers to the new feature of accelerated endowment policies issued by this company only, as mentioned in their advertisement on another page, and fully explained in their circulars, which will be sent free on application. Under the "Accelerated Endowment Plan," recently originated by the Mutual Benefit Co., the date of payment (maturity) of all kinds of policies is considerably hastened ("accelerated") by the surrender of the dividends to the company from year to year, and ordinary life policies mature, and the amount of the insurance paid to the member during his lifetime. The only insurance journal on this coast, the *Pacific Coast Review*, speaks of this company as follows:

"A faithful and economical management, the Mutual Benefit Life Insurance company, of Newark, N. J., has a record equal to any company in America. Its dividends paid to gross premiums received, have been larger than those of any other company for the past ten years, and its average ratio of expense of management to income, since its organization, only amounts to eight and 76-100 per cent. It is purely mutual, dividing up the surplus and profits with the policy-holders. It is a sound and reliable company, under judicious management, and entitled to the full confidence and liberal patronage of the public."

PATENTS & INVENTIONS.

A Weekly List of U. S. Patents Issued to Pacific Coast Inventors.

FROM OFFICIAL REPORTS FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.]

By Special Dispatch, Dated Washington D. C. Feb. 15th, 1876.

FOR WEEK ENDING FEBRUARY 1ST, 1876.

DIRECT ACTION STEAM ENGINE.—William C. Wilcox, S. F., Cal.

ROAD SORAPER.—Robert A. Haw, Eureka, Cal.

CARPET CLEANER AND BEATER.—Chas. Elsasser, S. F., Cal.

BALE TIE.—Thomass Bailey, S. F., Cal.

British Patents for Pacific Coast Inventors.

Following is a list of inventions patented or protected by provisional specifications in England, by inventors in the Pacific States and Territories, from July 1st to December 31st, 1875:

ELECTRO-MAGNET.—W. L. Powelson, S. F., Cal.

OVERSEAM SEWING MACHINE.—J. L. Boone, S. F., Cal.

PREPARING FIBER.—C. C. Coleman, S. F., Cal.

PRINTING PRESS.—A. E. Redstone, Oakland, Cal.

SHIP'S TABLE.—E. P. S. Andrews, Havilah, Cal.

Canadian Patents for Pacific Coast Inventors.

Following is a list of inventions patented in Canada by inventors in the Pacific Coast States and Territories, from July 1st to December 31st, 1875.

POCKET-FASTENED PANTS.—J. Greenbaum, S. F., Cal.

SNOKE CONSUMER.—W. L. Powelson, S. F., Cal.

LOCK.—H. Rogers, Eureka, Nev.

HYDRAULIC JACK.—E. Biddle, Carlin, Nev.

"The patents are not ready for delivery by the Patent Office until some 14 days after the date of issue. NOTE.—Copies of U. S. and Foreign Patents furnished by Dewey & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s Scientific Press American and Foreign Patent Agency, the following are worthy of mention:

PORTABLE CARPET BEATER AND CLEANER.—Chas. Elsasser, S. F. This invention is a machine which is adapted for heating and cleaning carpets upon the floor without taking them up. It consists of a box, which is divided horizontally into two compartments. The bottom of the lower compartment is open, and a spring beater is placed in it, so as to be operated by a friction wheel which is rotated by pressure against the floor as the box is moved along. A suction fan is arranged to draw the dust which is raised by the beater into the upper compartment or dust chamber. The beater is composed of a number of parallel bars placed at a short distance apart and secured together by transverse bars on the upper side. This beater is placed across one end of the box at its bottom, and has a strong metallic stem extending upward from its middle and passing through a guide in the lower compartment. The upper end of the stem is hollow, and a strong spiral spring is placed in the hollow or cavity. A screw regulates the tension of the spring and the force of the blow. A shaft passes across the box, and upon it is a cam, which, when the shaft is rotated, strikes a projection or tappet on the stem and lifts the beaters, while the spring drives them back against the carpet when the cam leaves the tappet. The entire power for driving the machine is derived from the pressure upon the machine as it moves over the floor. A fan draws the dust into the upper box. The lower edges of the box are suitably packed to prevent any dust from escaping from the lower compartment. This machine will run over a carpet like an ordinary carpet beater, and will beat and sweep it clean without removing it from the floor. By using this machine once every two or three days upon a carpet it can be kept perfectly clean and free from dust without the disagreeable necessity of occasionally taking it up and sending it away to be beaten and cleaned.

TREATING ORES.—Eames & Patchen, San Francisco. This is an improvement on the Patchen process, which lately attracted considerable attention. When ore pulp is treated in iron pans with a chloride of copper, the iron of the pan precipitates the copper so that its effect upon the gold and silver contained in the pulp is lost. To remedy this difficulty Abel Patchen secured a patent in 1874, in which he claims the process of treating the pulp in a copper or wooden vessel before introducing it into the iron pans for amalgamation, thus allowing the silver to be chloridized before it enters the iron pan. These inventors have discovered, however, that by using a certain substance they can chloridize the metal contained in the pulp, directly in the iron pans, without the necessity of providing an extra vessel for the treatment of the pulp. They also claim

that by having the peculiar substances in the iron pan, the effect of the iron pan or the iron salt is neutralized so that little or no copper will appear in the amalgam; although the use of these chemicals enables these inventors to treat the ore chemically and without unfavorable results in an iron pan, they claim that they can produce superior results both in the quantity and fineness of the bullion by using them in the wooden or copper vessel claimed in Patchen's patent, and when the wooden or copper pan is already in use, they shall preferably use this process as being the most successful; but when the iron pans only are in use they will use the chemicals in the iron pan.

ATTACHMENT FOR RAWHIDE FULLING MACHINE.—Herman Royer, S. F. This is an improvement on a previous patent for a rawhide fulling machine, by the same inventor. It consists in an automatic belt shifting device, by which the inventor is enabled to run the machine in one direction for a sufficient length of time and then reverse it, this process continuing automatically until the leather is finished. The machines are usually operated by belts, but gears or friction coupling could be used, and the action of the machines still be automatic. The machine turns in one direction until a lever has passed the center and fallen over so as to shift the belt to the other pulley, when the whole mechanism will be moved in the opposite direction. The inventor claims the belt shifting device for the purpose of making the operation continuous and automatic, in combination with the rawhide fulling machine operating to twist the leather alternately in one direction and the other.

General News Items.

SERVIA is determined on war.

SENATOR SHARON has gone to Washington.

AND now they have unearthed an opium ring.

THE new iron furnace at Chico has been started up.

JAMES PARTON, the author, has married his stepdaughter.

F. X. MURRAY was run over and killed by a Mission street car last Saturday.

THE appropriation for the San Francisco mint will probably be reduced.

A reduction of fully 33 per cent. in rents is probable throughout New York city this spring.

GILFORD WHITE, a Boston lawyer, has been arrested for purchasing \$33,000 in stolen bonds.

THE new building at Berkeley, to be occupied by the California Watch Co., is nearly completed.

BEN CHAMBERS, a saloon keeper of Ukiah, killed his two brothers-in-law by shooting them in a quarrel last Monday.

THE manufacturers of pine lumber have agreed to run their mills on three-quarters time for the next 60 days.

MONSIEUR D. CONWAY, of London, has been called by the Parker Fraternity society in Boston to accept the desk formerly occupied by Theodore Parker.

THE robber of the New London bank has turned out to be the teller of the institution. All of the money has been recovered and he makes a full confession.

THE Khedive has asked for the assistance of an English financier and the British government has sent him Charles Rivers Wilson, controller general of the national debt.

GENERAL ANDRES PROCO, noted as a gallant officer under the Mexican government at the time of the acquisition of California by the United States, died in Los Angeles on Monday last.

COLLECTOR SHANNON has suggested to the Secretary of the Treasury the advisability of the Government either doubling the duty on coal or else erasing it altogether. At present it costs 13 per cent. of the duty to collect it.

LAST Saturday a terrible explosion occurred in the Esstern mine, belonging to the Lehigh Valley coal company, and located in West Pittston, Penn., caused, it is believed, by one of the miners taking a lighted lamp into a chamber filled with foul air. The force of the explosion tore away the props, doors, tracks and great masses of rocks and coal. Four men were killed on dead, and twelve others more or less burned and mangled.

REVEREND JOHNSON, the distinguished statesman and jurist, was found dead on Thursday evening of last week, in the grounds of the Governor's mansion at Annapolis, Maryland. He was the guest of Governor Carroll, and dined that evening with other gentlemen at the Governor's house. It is supposed that he fell upon the stone pavement, as he was bleeding profusely when found. The skull was fractured from the upper portion of the forehead to the eyebrow, and there were cuts and bruises on the hands and legs.

Nothing is so insidious as a cold or a cough. Poison does not make make swifter progress in the system. Use promptly the only sure antidote, **HALL'S HONEY OF HOREHOUND** AND TAR.

HALL'S Toothache Drops cure in one minute.

WOODWARD'S GARDENS embraces an Aquarium, Museum, Art Gallery, Conservatories, Tropical Houses, Menagerie, Seal Ponds and Skating Rink.

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Big Guns and their Cost.

Just at present there is a mania in Europe for the manufacture of enormous cannon. One would think that several of the great nations were trying to see which can bring out the biggest gun. When the English 81-ton piece was successfully completed, it seemed likely to hold the field for some time without a rival; but before three months have elapsed we find that Italy has ordered four 100-ton guns from Sir William Armstrong, and that Krupp, in Prussia, "has in hand" (figuratively speaking, of course, though Krupp is a giant in a business way at least) a monster of 124 tons. Of course John Bull does not mean to be outdone, and it is announced in the English journals that "the authorities at Woolwich are prepared to commence a gun of 160 tons as soon as permission is granted."

The 81-ton gun has cost \$75,000, and the price named for the "Newcastle infants" of 100 tons for the Italian navy is \$120,000 each. We have not seen it stated what the Krupp monster is to cost, but it will probably be \$150,000 or more.

The testing of these guns, to say nothing of their use in actual service, adds not a little to this enormous expenditure. Every time the 81-ton piece is fired, it blows \$125 into the air, 240 pounds of powder and a projectile of 1,260 pounds being the charge in the first trials. In some of these rounds, 250 pounds of powder and a 1,465-pound shot were used. It is now proposed to increase the bore of the gun from 15½ inches to 16 inches, after which operation the charge will be proportionately augmented.

The Italian guns are to fire projectiles of 1,860 pounds each, while the Krupp cannon will send a ball of 1,040 kilograms, or about 2,300 pounds, through the air; how much powder is to be used in doing it we are unable to say. One gets, however, a new idea of the power of gunpowder when he learns that a few hundred pounds of it can propel a missile of more than a ton's weight over a distance of several miles. In the case of the 81-ton gun, the shot of 1,260 pounds left the muzzle with a velocity of 1,400 feet a second, and a momentum that would carry it through 20 inches of iron plating at a range of half a mile.

The *Dulius*, for whose armament the four 100-ton Armstrong guns are intended, is described as being the most powerful iron-plated frigate ever yet devised. She is to be armored with plates 19 inches in thickness, and moved by engines of 7,000-horse power.

Iron Rust a Cause of Fires.

An English writer asserts that where oxide of iron is placed in contact with timber, excluded from the atmosphere, and aided by a slightly increased temperature, the oxide parts with its oxygen, is converted into very finely divided particles of metallic iron, having such an affinity for oxygen that, when afterwards exposed to the action of the atmosphere from any cause, oxygen is absorbed so rapidly that these particles become suddenly red-hot, and, if in sufficient quantity, will produce a temperature far beyond the ignitable point of dry timber. Wherever iron pipes are employed for the circulation of any heated medium (whether hot water, hot air, or steam), and these pipes are allowed to become rusty, and are also in close contact with timber, it is only necessary to suppose that under these circumstances the finely divided particles of metallic iron become exposed to the action of the atmosphere (and this may occur from the mere expansion or contraction of pipes), in order to account for many of the fires which periodically take place at the commencement of the winter season.

ELECTRIC WHISTLE.—M. Lartigue, in charge of the electric service of the Northern railroad of France, has recently described a mode of warning the engineer of a locomotive approaching a station that the track ahead of him is already occupied. M. Lartigue states that the apparatus has been in use for more than a year, and has already prevented several possible accidents. It consists essentially of a piece of wood about two yards long, covered by a plate of copper which is included in the electric circuit controlled by the operator at the nearest station. The plate is raised about four inches above the level of the rails and placed between them. When the locomotive passes over this contrivance, a brush of metallic wires which it carries is pressed smartly against the plate and closes the circuit on the locomotive, bringing a soft iron magnet into contact with its armature, and thereby opening the valve of a steam whistle, which continues to sound until shut off again by the engineer. The principal objections to the contrivance seem to lie in the facts that it requires the previous action of a telegraphic operator, and operates only in the vicinity of stations.

SUBSTITUTE FOR THE SAND BOX ON LOCOMOTIVE ENGINES.—We see that Mr. W. Miller, the locomotive superintendent of an English railroad, has been experimenting on the use of hot water from the boiler, instead of sand, as a means of promoting adhesion on railroads. His experiments have convinced him that were his apparatus applied to locomotives it would entirely supersede the use of sand, for according to Mr. Mole-worth's rule he gains 350 pounds per ton on each coupled wheel during frosty or "greasy" weather. Mr. Miller would have patented his apparatus had he not discovered that a similar idea was registered many years ago.

The Simplest, Cheapest, Most Effective and Durable

Power Drill is the New

"CALIFORNIA" ROCK DRILL,

MANUFACTURED BY

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And Complete Mining Outfits for Power Drills.

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GIANT POWDER.

Patented May 26, 1868.

THE ONLY SAFE BLASTING POWDER IN USE.

GIANT POWDER, NO. 1,

For hard and wet Rock, Iron, Copper, etc., and Submarine Blasting.

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For medium and sandy Rock, Lime, Marble, Sulphur, Coal, Pipe Clay and Gravel Bank Blasting, Wood, etc.

Its EXCLUSIVE use saves from 30 to 60 per cent. in expenses, besides doing the work in half the time required for black powder.

The only Blasting Powder used in Europe and the Eastern States.

BANDMANN, NIELSEN & CO.,

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Iron and Machine Works.

THE RISDON

Iron and Locomotive Works,

INCORPORATED.....APRIL 30, 1868.
CAPITAL.....\$1,000,000.

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Embracing ALL SIZES of

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Standard sizes of railroad Car Wheels, with special patterns for Mining Cars. These small wheels are made of the best Car Wheel Iron, properly chilled, and can be fitted up with the improved axle and box—introduced by this company, and guaranteed to outlast any other wheels made in this State.

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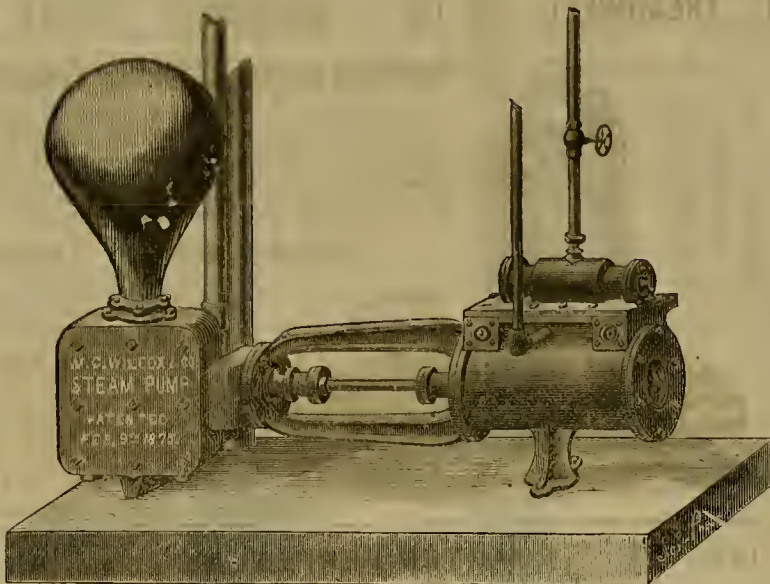
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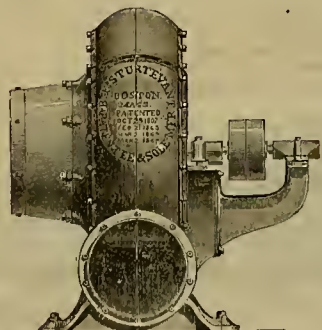
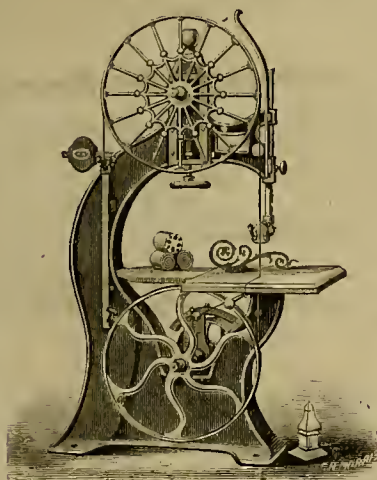
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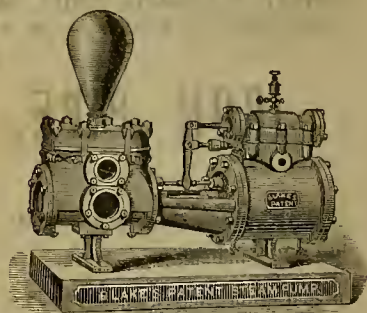
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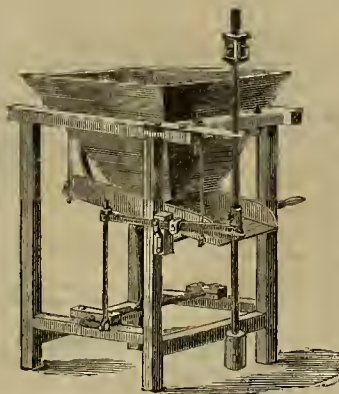
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And many other Mills using them.

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PASO ROBLES, CAL., October 18th, 1875.

DEWEY & Co.—Gents: The letters patent for the Tire Upsetter have come to hand. For the prompt manner with which you have brought the matter to a successful issue, please accept my thanks.

Yours Respectfully, JOHN H. MERTZ.

SACRAMENTO, May 29th, 1875.

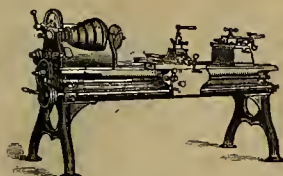
MESSRS. DEWEY & Co.—Gentlemen: Yours of the 27th inst. is received. The patent came duly to hand yesterday, by express. Please accept thanks for your promptness in obtaining the same.

DUNCAN DEAMONT.



ASHCROFT'S
Steam Gauges.

The very best in the country. A large stock at reduced prices.



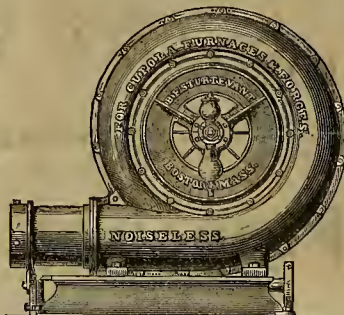
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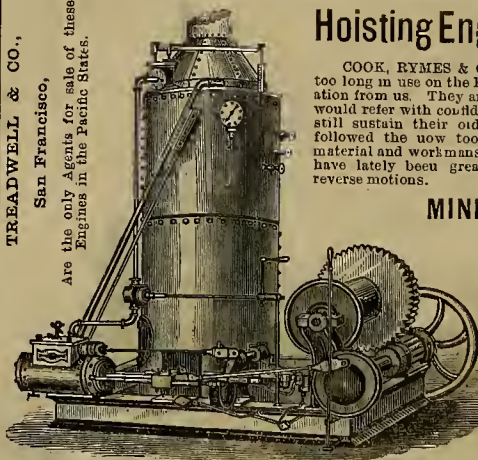
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With the best Dramatic Company in the United States. Box office open from 9 A. M. to 10 P. M. Seats may be secured six days in advance.

Monday, Feb. 21, Benefit of T. W. KEENE.

Doors open at half past seven; Commence at eight o'clock.

TREADWELL & CO.,
San Francisco,
Are the only Agents for sale of these
Engines in the Pacific States.



Hoisting Engines. Mining Engines.

COOK, RYMES & CO.'S celebrated Hoisting Engines have been too long in use on the Pacific coast to require any special recommendation from us. They are well known from Alaska to Mexico. We would refer with confidence to any one of the hundreds in use. They still sustain their old reputation, the manufacturers not having followed the now too common practice of reducing the quality of material and workmanship to compete with cheaper engines. They have lately been greatly improved by adding large drums, and reverse motions.

MINING HOISTING ENGINES.

(Manufactured by the same parties.)
Our new Mining Engine is built from plans and specifications of several of our most successful MINING ENGINEERS, and the result is the most complete

Double Drum Hoisting Engine
Ever built. Their advantages will be seen at a glance by any one familiar with the necessities of a mine. These engines may be seen in use in Ophir, Con. Virginia, Chollar, Europa, Niagara, Leviathan, Phil Sheridan, and several other mines on the Comstock Lode. For sale only at

TREADWELL & CO.'S,
SAN FRANCISCO.

1845. CHARTER PERPETUAL. 1876.

Economy, Security.

Mutual Benefit Life Insurance Company,

NEWARK, N. J.

Assets, January 1st, 1876, - - - \$31,085,011 11

LEWIS C. GROVER, Pres't. JAMES B. PEARSON, Vice-Pres't.
EDWARD A. STRONG, Sec'y. BENJ. C. MILLER, Treas. B. J. MILLER, Actuary.

The following is a summary of the business of this Company, from May 1, 1845:

Total Receipts,	- - - - -	\$81,149,507 76
Paid Losses and Endowments,	- - - - -	19,284,541 48
" Dividends or Return Premiums,	- - - - -	19,224,524 15
" Surrendered Policies,	- - - - -	4,284,344 82
" Expenses—Management, Commissions, Taxes, etc.,	- - - - -	8,167,913 05
The Ratios are:—		
Expenses, (excluding taxes,)	- - - - -	8.60 per cent.

These results are more favorable to the insured than those presented by any Company in the World.

ALL KINDS OF APPROVED POLICIES ISSUED.

Dividends paid annually, or they can be applied on the Accelerative Endowment Plan, as ORIGINATED BY THIS COMPANY, to which particular attention is called.

ACCELERATIVE ENDOWMENT PLAN.

The plan is intended to meet the wants of those who wish protection for their dependents in case of premature death, and at the same time make a wise provision for themselves in the event of surviving the productive period of life.

The plan proposes that instead of using dividends in reduction of the annual premium, the insured may, at his discretion, pay his premium in full in cash, and surrender his dividends to the company. In consideration of this surrender, the company will agree to pay the sum assured when the policy holder shall have attained a certain age, or at his previous death, instead of at death only, thus enabling him to procure an Endowment Policy at the usual rates charged for policies payable at death only.

If the policy is already an Endowment, payable at a given age or previous death, the surrender of the dividend will enable the company to agree to pay the policy at a still younger age.

Advantages of the Accelerative Endowment Plan

Over any other yet offered to the public, will be apparent when the following features are considered:

It can be applied to any policy, whether "Life" or "Endowment," to old business as well as new, where there is no premium-loan, or where the existing premium-loan shall be paid off.

It enables one to obtain an "Endowment" policy at the usual "Life" rates.

The expenses incident to this form of "Endowment" insurance being no greater than in case of "Life" policies, its superiority to the old style of Endowment insurance will be readily perceived.

It not only has the effect of constantly reducing the age at which the company will agree to pay the policy, but also, every dividend so applied becomes itself the source of future savings, thus causing the dividends to increase much more rapidly from year to year than would be the case if they were used in payment of the annual premiums.

The assured can, in any year, apply his dividend in payment of premium, and allow the time at which the policy matures to remain as at the previous year's settlement.

As each dividend is surrendered, the company will make a positive agreement as to the time at which the policy will be paid, and the amount payable at such time.

It at any time the assured becomes disappointed or dissatisfied with the plan, he is at liberty to use his future dividends in payment of premium, and to retain all the advantages accruing from the surrender of past dividends.

If at any time the party should be unable or unwilling to continue payment of premiums, the company will, within three months from the date of lapse, allow the equitable value of the policy in paid-up insurance.

The Mutual Benefit Life Insurance Company issues Policies insuring the lives of healthy persons residing in any part of the United States.

JAMES MUNSELL, Jr., Agent of Insured,

And Acting Agent for persons desiring Life Insurance,

224 Sansome Street, - - - - - San Francisco.

\$5 to \$20 Per Day at home. Terms free. Address G. STINSON & Co., Portland, M. Dewey & Co. { 224 } Patent Agt's.

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SAN FRANCISCO,

MANUFACTURER AND IMPORTER OF
Church and Steamboat BELLS and GONGS,
BRASS CASTINGS of all kinds,
WATER GATES, GAS GATES,
FIRE HYDRANTS,
DOCK HYDRANTS,
GARDEN HYDRANTS.

A General Assortment of Engineers' Finding.
Hooker's Patent
Celebrated

STEAM PUMP

The Best and Most
Durable in use. Also,
a variety of other

PUMPS

For Mining and Farming
Purposes.

ROOT'S BLAST BLOWERS.

For Ventilating Mines and for Smelting Works.

HYDRAULIC PIPES AND NOZZLES,
For Mining Purposes.

Garratt's Improved Journal Metal.

IMPORTER OF
IRON PIPE AND MALLEABLE IRON FITTINGS.

ALL KINDS OF
WORK AND COMPOSITION NAILS,
16 - 4t
AT LOWEST RATES.

WIRE ROPE

For Mining, Shipping, and General Purposes.

All kinds and sizes on hand, or made to order; guaranteed of unsurpassed quality, and manufactured of any length. FLAT ROPES, ROUND ROPES and TAPER ROPES, OF IRON OR STEEL.

Patent Endless Wire Ropeway

(WIRE TRAMWAY.)

FOR THE RAPID AND ECONOMICAL TRANSPORTATION OF ORES AND OTHER MATERIAL OVER MOUNTAINOUS AND DIFFICULT ROADS.

This system has been in use for over three years, and given thorough satisfaction.

PATENT GRIP PULLEY.

For transmission of power by means of wire ropes.

WIRE.

Fencing Wire and Staples,
ALING WIRE,
SPRING WIRE,
GALVANIZED WIRE,
BROOM WIRE,
STEEL WIRE,
COPPER WIRE,
BRASS WIRE,

And Wire of all kinds, on hand or made to order.

SOLE AGENT FOR

Richard Johnson and Nephews' Celebrated Telegraph Wire.

Full stock on hand in bond, or duty paid.

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FULL ASSORTMENT ON HAND FOR ALL PURPOSES, AND

All Kinds of Goods in the Wire Line.

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Money Loaned on Leading Stocks.

MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO.,
Patent Solicitors.

SAN FRANCISCO, SATURDAY, FEBRUARY, 26, 1876.

VOLUME XXXII
Number 9.

Pump Manufacture in San Francisco.

In the manufacture of heavy pumping machinery the artisans of San Francisco no doubt excel those of any other city in the Union. The requirements of the deep mines of this coast are such as to call forth all possible ingenuity to overcome the great obstacle of water. The pumping machinery on the Comstock, all of which was made by the foundries of this city, is probably unequalled in the world; and yet, with all its strength and power, in some cases it is next to an impossibility to keep the mines free of water. Every now and then a body of water breaks in that tasks to the utmost all the pumping appliances at hand, and it is only by incessant, steady work that it is overcome. The manufacture of pumps of all sizes and kinds, therefore, has become a specialty of California machinists, and they now turn out from their shops pumps which are adapted to any special class of work, from the small pump for household purposes to the ponderous steam machinery for draining deep mines. Ingenious mechanics, who have made pumping machinery a life study, are continually at work inventing and improving in this direction, until it would seem as if perfection had been reached and there was no room for a step in advance. Occasionally, however, a lucky idea strikes some one, and some advantage over previous methods is gained.

We saw this week at the San Francisco steam pump works, on Beale street, a pump which has been constructed for the Bay sugar refinery, the first of its kind which has been made. It was designed by W. C. Wilcox, one of the proprietors of the works, and is intended specially for pumping molasses, syrups, coal tar, quicksilver, or any heavy liquid substance, although it will pump water as well. It is not an improvement, but a new invention. There are four slide valves in the ordinary place that poppet valves would be, each end of the valve in a V groove. The valves are handled by two little independent steam cylinders, and so arranged as to produce an instantaneous reversion of the valves at the instant steam is reversed in the engine, leaving clean wide unobstructed openings exactly at the proper time for action. The two small cylinders operating the valves receive their steam from alternate ends of the main cylinder and at the residue of the stroke of the piston. The instant steam enters into the main engine at one end steam enters into the two small cylinders and reverses the valves, and vice versa.

The valves work instantaneously with no noise and no lift. The opening of the valve seats is not obstructed at all by the valves being over it. The small cylinders are fastened on the end of the valve chamber of the pump by yoke connection. When the main engine exhausts the small cylinders alternately exhaust, and they take steam at the time the main cylinder does. The steam pipe connection between the cylinders is quite simple and unobtrusive. This pump seems admirably adapted to the purposes for which it is intended.

At these same works they are now making a number of different sized pumps, slide valve, deep well, poppet valve, etc. They employ from seventeen to twenty men, working principally on pump manufacture. They are principally occupied in the manufacture of the San Francisco steam pump, which was successful at the late trial of steam pumps at the Mechanics' Institute fair and won the gold medal. This is sometimes called the Wilcox pump, from its inventor, but should not be confounded with the Wilcox water lifter, a totally different thing and patented by another inventor. The success of the San Francisco pump at the competitive trial has had the effect of bringing a large number of orders to the manufacturers and of very effectively aiding in introducing a new and valuable improvement. They are now filling several mining orders and are prepared to contract to put up mining or irrigating works of any magnitude.

At the works can now be seen a pumping en-

gine designed by Mr. Wilcox for the artesian well of the Palace hotel. It stands on end over the well, the pump being lowered 100 feet in the well. The pump can be let down to any required depth and the engine placed vertically over it. Pumps of this class are made to suit any diameter of well. In this case the water is to be raised by a single lift to the top of the building, about 250 feet in all, and the pump is constructed to

Screw Cutting Machinery and Tools.

We illustrate on this page several forms of screw cutting tools, such as are manufactured by the Wiley & Russell manufacturing company, of Greenfield, Mass. Figure 1 is a No. 40 bolt cutter and nut tapper, fitted with seven sizes,

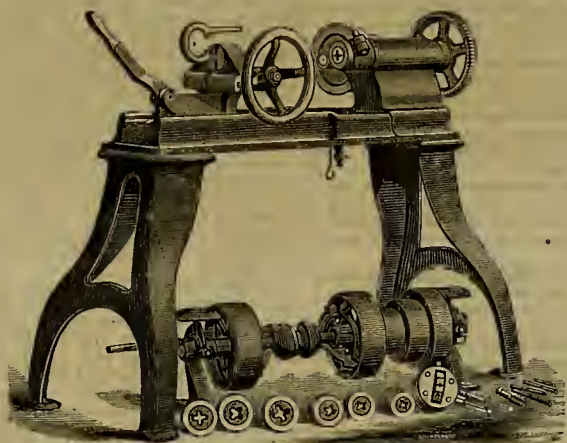


FIG. 1. BOLT CUTTER AND NUT TAPPER.

deliver 15,000 gallons per hour. The engine stands on two handsome fluted columns, and is arranged so that in case the pump should get out of order the engine can be swung around from the top of the well to one side. This piece of machinery is being neatly con-

structed and will be in keeping with its aristocratic surroundings. The San Francisco steam pump works, although only recently established by Messrs. Wilcox & Co., is doing quite a good business. They make a specialty of machinery for hand-

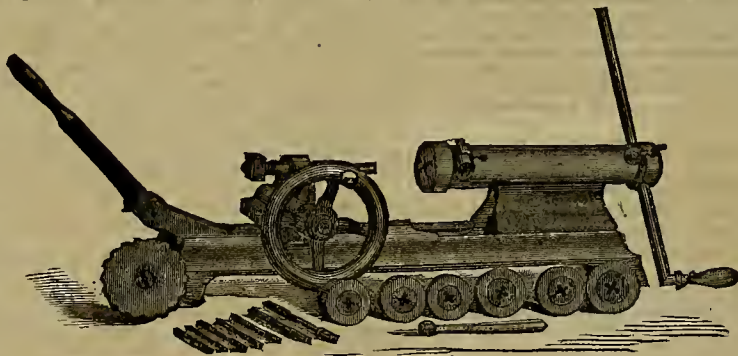


FIG. 2. BOLT CUTTER AND NUT TAPPER.

structed and will be in keeping with its aristocratic surroundings.

The San Francisco steam pump works, although only recently established by Messrs. Wilcox & Co., is doing quite a good business. They make a specialty of machinery for hand-

revolve. This machine is designed to satisfy such a want, and cuts well for straight or crooked work. The dies are held separately in collets. A strong vise holds the bolts or nuts, and a tap chuck is fitted to the same

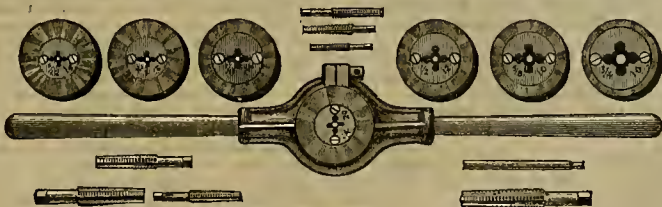


FIG. 3. THE LIGHTNING SCREW PLATE.

ling water, although they are prepared with proper tools for doing any class of machine-shop work. They are now building a hand pump of peculiar construction, with valves so set that any ordinary person can take them out and replace them with ease. Mr. Wilcox is a methodical and painstaking inventor, and we are glad to be able to record the successful introduction of his inventions.

The steam hoisting works for the development of the West Belcher mine are being put in working position, at the old Overman shaft, as fast as possible.

upon the work is caught and drained into a basin in the bed piece, under the die holder. It is, in all respects, a carefully and thoroughly made machine; nothing is slighted, but all the parts are made strong and handsome, and dies and taps are of same quality as those furnished with other machines by the same manufacturers. Not only dies and taps, but every part can be duplicated promptly to order.

Figure 3 is a representation of the lightning screw plate. The chief feature of this invention is that the die does its work in a single cut, thus forming the screw thread at once, instead of by several trials, as is the case with the implement in ordinary use. In order to compensate for wear the die is capable of proper adjustment, so that it will keep its size with accuracy until used up, or over a long period of constant employment. It is stated that although it finishes its work at one cut, its operation is easier than the first trial with the common plate. With it a man can cut one and a half inch bolts without help, say three threads three inches long, one in three minutes. It is claimed that this invention will accomplish five times the work possible with any other screw plate. The threads are cut neatly and sharply into the bolts, and not, as is frequently the case with the common tool, jammed out of their iron so as to raise the threaded portion above the normal surface, thus impairing the accuracy and regularity of the operation. The dies allow of nuts and bolts for different purposes being made to fit together tightly or loosely, as desired. When worn out they can be replaced, the plate and collets remaining good. The articles threaded need not be matched and kept together, as they always correspond without being tried or fitted. The collets holding the dies have guides, as shown in the engraving for starting bolts true, though, when it is desirable to cut close under the heads of the latter, the face side is used. The design of the plate combines ample strength with remarkable lightness, and in quality, style and finish, the device appears to be an excellent tool. These tools may be seen at the agents, in this city, Messrs. Dunham, Carrigan & Co., 107 to 111 Front street.

A BOUNTY FOR STEAM POWER.—Mr. Hart, of Colusa, has introduced a bill "to encourage the invention of a machine as a substitute for horse power." It seeks to appropriate \$15,000 as a bounty to any citizen of the State who shall invent, and, after two years' continued trial and use, shall produce a machine propelled by steam or other motive agent, the object of which is a substitute for the use of horses or other animals on the highways or farm. The test of successful use shall be that any machine or locomotive entering the lists to compete for the bounty shall successfully plough at least 1,000 acres of land, as well and at a cheaper rate per acre than the same can be done with horses or other animals, and shall perform a journey of at least 200 miles on a common road in this State, propelled by its internal power, at an average rate of at least four miles per hour, working time. It must be of such construction and width as to conform with or run in the ordinary track of the common dray or truck now in use.

On the Ophir mine the main east drift on the 1600-ft level has been cleaned out and repaired to the face, and is again being extended to the eastward, cutting good milling ore some 150 feet further north than any that has yet been found in that portion of the mine. This is certainly a very favorable indication, proving, as it does, the extension of the ore body northward on the lower levels. The southeast drift on the 1100-ft level is being steadily advanced, the face in low grade ore. The prospect of yet finding an upward continuance of the ore bodies by this drift still further to the eastward is growing more encouraging every day.

LATE reports from Sawyer's Bar say the snow storm of last week deposited about six feet of snow in the Salmon River mining section, and the snow is very deep on the trail leading to Sawyer's Bar.

A new east body of rich ore has been opened in the Belcher mine which promises a large yield. The ore is rich in gold, the gold veins largely predominating over that of the silver.

CORRESPONDENCE.

The Fryer Process.

EDITORS PRESS:—The great interest which in all mining circles of this coast is presently felt in the Fryer process will justify my offering a few remarks on the subject. From the description given in the *SCIENTIFIC PRESS*, it appears that only atmospheric air, and perhaps steam, applied at a high temperature, are intended as roasting agents. This plan would, after the old style of roasting, be in contradiction of the well-known chemical affinities of silver. If sulphur were the only base admixture to silver ore, the roasting or desulphurizing of silver ore would be as simple as the burning of limestone or the desulphurizing of cinnabar; sulphur and silver part completely in a high temperature when oxygen is admitted. But arsenic and antimony, which are, besides sulphur, present in nearly every kind of silver ore, cannot be separated from silver merely by air and heat; they will on the contrary form arseniates and antimonates of silver, which are more refractory against amalgamation than the original combinations. For the roasting of silver ore salt is therefore generally employed with the view to separate these arseniates and antimonates by forming on one side chloride of silver, which has the desirable quality to amalgamate easily, far easier than metallic silver; and on the other side chlorides of arsenic and antimony, which are volatilized.

These facts, however, are so well known that I do by no means suggest—as the *Mining and Engineering Journal* rather unkindly does—that Mr. Fryer should not be perfectly aware of them. I would sooner suppose that Mr. Fryer's plan is a different one. There is in Sweden a most curious roasting process for copper ore used, by which the copper is concentrated in the centre of the single pieces of ore. An experiment not less curious can be made with silver ore. Heat a piece of silver ore in a common blacksmith fire to a red-hot temperature and plunge it into cold water: there will then be numerous drops of metallic silver found on the surface. I do not know what percentage of silver and gold can be separated in that way, but I almost believe that Mr. Fryer operates on the same principle. Some reporter, admitted to the works, mentions that he saw the burned ore covered with little drops of silver, by which I am led to believe that the unknown part of the Fryer process consists in dropping the red-hot mass of ore out of the furnace into a tank of water.

But whatever the treatment of the ore may be, it seems beyond doubt that a chloridation is not the object of the Fryer process and that silver and gold are to be separated in a metallic state. The probable results of the new method will then be the following:

1. Metallic gold amalgamates easily and the process will for gold-quartz most likely be successful.

2. Metallic silver amalgamates so very slowly that the little drops of silver may offer serious difficulties to amalgamation.

3. As the furnace is evidently intended for a great heat (which the suggested operation indeed requires) the process will do best for such ore as is not liable to smelt; while ore containing a certain amount of antimony, lead, copper or some other easily fusible metal, might be more or less melted in the furnace, by which the crushing as well as the subsequent amalgamation would become either impossible or very imperfect.

THERE is a lively discussion at San Jose whether the road to the site of the Lick observatory, on the summit of Mount Hamilton, shall be built by Chinamen, as the contractor to whom the work was awarded can hardly keep in the terms of the contract without employing cheap labor. The white workmen, many of whom have come from long distances in hope of a job, are naturally disgusted with the idea, and Mr. Lick has sent a dispatch to San Jose to the board of supervisors of Santa Clara county to the effect that if a Chinaman was employed in the construction of the Mount Hamilton road they would not receive a dollar from him.

SINGULAR CAUSE OF DEATH.—A woman residing in Albany county, N. Y., awoke one night lately with a severe headache, and, taking a bottle of salts from a stand near by, applied it to her nose occasionally. She soon fell asleep, and on awakening in the morning found that she had retained the bottle in her hand, and that the salts had drawn a blister on her thumb, which had covered the mouth of the bottle. In a short time inflammation arose, gangrene set in, and in spite of every effort to stop its progress her entire system became poisoned so that she died.

THE CENTENNIAL.—Mr. George Bancroft expresses the belief that the coming Centennial exhibition will in every respect excel any international exhibition heretofore given. He thinks it will drive away hard times and encourage immigration to an astonishing extent. Mr. Bancroft thinks the next presidential campaign will be the most exciting one of our history.

Amendments to the Coinage Act.

The following is the full text of Mint Director H. R. Lindermann's letter to the Secretary of the Treasury, recommending important amendments to the Coinage act:

"I have the honor to recommend for your consideration, and such action as you may deem appropriate, the repeal of so much of section fifteen of the coinage act of 1873 as makes the trade dollar a legal tender at its nominal value for any amount not exceeding five dollars in any one payment. When the issue of this coin was first proposed, it was not intended to be a coin for circulation in the United States or legal tender in payment of debts, but simply an agent in our commerce with foreign countries, particularly China. It appears to have been inadvertently made a legal tender by being incorporated in the section of the coinage act prescribing the weight and legal tender of the small silver coins. At the time of the issue of the trade dollar (1873) its bullion value was slightly more than its face value, and no inconvenience was experienced until since the market decline which has taken place in the value of silver. Its bullion value is now about 94 cents in gold. Adding to this the cost of coinage, one and one-fourth per cent. on its nominal value, gives to the depositor for trade dollars a profit of four and three-fourth per cent., provided he is able to use it at par. In consequence of this margin of profit the tendency on the Pacific coast, where the business is conducted on a gold basis, is to force the trade dollar into circulation, and being at a discount as against gold, inconvenience in retail transactions is experienced. Moreover, it conflicts with the sound principle that wherever an overvalued coin circulates as money, by reason of its legal tender power, the seigniorage or difference between its bullion and nominal value should be realized by the Government and not by individuals.

"Under existing laws deposits for trade dollars may be made without limit, the depositor paying the expense of coinage, while all other silver coins are fabricated exclusively on government account.

"The purpose for which the trade dollar was authorized would not be interfered with if the provision of law making it a legal tender should be repealed, and it is believed that such repeal would prevent any complication in future with our monetary system, as the coin would not differ in any respect from a stamped bar, except in being of uniform weight and fineness, and of form for convenient use.

"If a silver dollar should be deemed necessary as a coin of circulation, it should be made of the same standard as the present silver coins of less denomination, and coined and issued exclusively on government account. There can be no objection to the issue of such a coin. On the contrary, it would be productive of some advantages.

"I inclose for your consideration a draft of a bill which, if enacted into a law, will confine the trade dollar to the purposes originally intended, and give a dollar of circulation of the same standard as the present half and quarter-dollar, twenty cent piece and dime, and a legal tender to the amount of ten dollars.

H. R. LINDERMANN."

Yield of the Comstock Mines.

Following is a statement of the proceeds of the mines of Storey county, Nevada, for the quarter ending December 31st, 1875, from the quarterly assessment roll:

BELCHER—Tons extracted, 30,268; value per ton, \$32; gross yield, \$969,762.51; total cost of extraction and reduction, \$600,104.27; net yield or value upon which taxes are levied, \$369,658.24; total amount of tax, \$4,998.81.

CHOLLAS-POTOSI—6,750 tons; value, \$16; yield, 110,890.64; cost, \$164,976.18; net yield, \$22,178.13; tax, \$277.23.

HALE & NORCROSS—2,950 tons; value, \$17; gross yield, \$32,720; cost, \$79,782.87; net yield, \$10,310.84; tax, \$128.89.

IMPERIAL—2,727 tons; value, \$27; gross yield, \$74,005.55; cost, \$55,923.01; net yield, \$18,083.54; tax, \$226.04.

CROWN POINT—29,742 tons; value, \$17; yield, \$506,010.79; cost, \$600,724.31; net yield, \$101,202.16; tax, \$1,265.03.

CON. VIRGINIA—26,792 tons; value, \$119; yield, \$3,205,906.92; cost, \$1,653,699.16; net yield, \$1,602,953.46; tax, \$20,036.92.

EMPIRE—2,560 tons; value, \$12; gross yield, \$32,720; cost, \$20,480; net yield, \$12,240; tax, \$153.

JUSTICE—7,297 tons; value, \$23; gross yield, \$16,865.78; cost, \$12,784.25; net yield, \$4,081.53; tax, \$52.02.

OPHIR—9,169 tons; value, \$45; gross yield, \$419,264.98; cost, \$208,734.50; net yield, \$217,530.48; tax, \$2,719.13.

VIVIAN—1,488 tons; value, \$15; gross yield, \$23,397; cost, \$20,561; net yield, \$4,679.40; tax, \$58.49.

YELLOW JACKET—761 tons; value, \$16; gross yield, \$12,176; cost, \$13,698; net yield, \$2,435; tax, \$30.44.

EXPRESS MILL (tailings)—1,800 tons; value, \$9; gross yield, \$17,100; cost, \$16,200; net yield, \$1,710; tax, \$21.38.

RAILROAD MILL (tailings)—4,000 tons; value, \$11; gross yield, \$44,000; cost, \$35,743.25; net yield, \$8,256.75; tax, \$103.59.

Idaho Mines.

A correspondent of the *Owyhee Avalanche*, writing from Heath district, says:

I see by the returns of the bullion shipments from the different States and Territories that Idaho has the past year instead of increasing her product decidedly reversed the case. Now, it is not for the sake of writing a glowing account of Idaho's prosperity that I will endeavor to show the cause of such an apparently anomalous state of affairs, to wit: That a young and progressive Territory should not increase her staple product, i. e., the bullion yield; the cause is such that, instead of being a sign of decadence, it is quite the contrary and must naturally redound to the future and permanent welfare of our country.

One of the most important causes is that for two years past the yield of gold in Boise Basin—the principal placer mining district of the Territory—has diminished purely through natural causes and that simply on account of the absence of water through the insufficiency of snow in the early part of the mining season; either there was no water, as was the case in 1874, or, as in 1875, the water went off with a rush too early to be of use to the miners.

Another and most important item is that the immense amount of gold yielded by some of our mining corporations was stopped on account of work being suspended in the upper levels, while they were placing their mines on a basis by the erection of hoisting works, sinking shafts and other necessary improvements for the better and more permanent success than ever heretofore attended them. This case may be illustrated by the works of the Gold Hill mining company, at Quartzburg, where over \$40,000 has been expended and not a return of a single dollar the whole year. The energy and perseverance of this company cannot be too highly extolled. It looks well for the ledges around the basin that a company like this could keep their 25-stamp mill running day and night for six months steady and then slap out to the tune \$40,000 to work below water level. They have their reward, for the ledge recently struck at a depth of nearly 200 feet has proved what all mining experts coincide in, viz.: That in the quartz the richest ore will always be found below the water level of the district.

Another item on the improvement of the country, which has kept thousands of dollars at home, has been the erection in the Banner district of a 20-stamp mill by Mr. Crafts of Idaho City. The ledge to be worked by this mill is among the richest yet discovered in any country, and when worked, as it will be the forthcoming season, will augment the yield of bullion to an extent that will hardly be deemed credible for an Idaho mine; and it will be no desultory hit or miss affair, for the mine has been thoroughly opened and prospected and the mill fitted with all the requisite appliances for saving the metal, and everything is in order for the word "go."

Instances could be mentioned *ad infinitum*, if necessary, to show that circumstances over which we had no control, such as the Bank of California, and other affairs, all helped to cause the recent retrogression. Idaho is to-day on a firmer and more prosperous basis than ever before. It is true, people growl, but then they do not know what it is for, except that they must be in fashion. The fact is, we are too well off—a good living is too easily obtained if anything. If some of our soreheads would go back East, where men are crying and rioting for bread alone, they would return better contented, I fancy; or even let them take a trip to "glorious California" and rattle, and my word for it, their first song would be, "Oh, carry me home."

The situation is easily accounted for: The mining extravagance of a bygone day has left its traces behind. Used as many have been in our palmy days to having money in plenty and scattering it as fast as we made it, it rather goes against the grain to have to look after picaunies; yet, as Shakespeare says, "to such a complexion must we come at last." So, the sooner we all quit growling, look upon the sunny side of life, live for the present instead of the future, and above all, put our shoulders to the wheel, and do the best for ourselves, the sooner our troubles will be over and we shall be better off.

Idaho is no exception to the general rule applying to all mining countries. In California and Colorado, after the cream, as it were, had been taken off, there was an era of decadence, we heard the same cries of the wounded, "a God-forsaken country," "the country's gone in," and many other choice epithets; well, if we look at either country to-day, we can see that the poor miserable wretches did not hurt it much. This class as a rule are of no account to themselves or anybody around them. Another thing in regard to Idaho's great failure and I am done: As a parallel to our Territory I will place what was once known on the maps as the Great American desert, embracing Kansas, Nebraska, Colorado, etc. Before being known it was supposed to be the home of the buffalo, there "the deer roamed and the coyote loved to dwell," and it was honestly supposed that the whole country was unfit for human habitation; now we see them among the highest stars in the galaxy of States, and just so sure as this then apparently worthless country has by progression and enterprise been transformed into a blooming garden, just so sure, and in our time, too, will Idaho march with giant strides to the front. Our now tenantless valleys will blossom as the rose, the sage brush

plains will be verdant with grain and our mines will be worked for their value—with the new improvements for saving the precious metal, who can even imagine the wealth our mountains will annually produce?

Right here in this district we have ledges of iron, copper, galena, silver and gold, all the base containing a good paying percentage of gold and silver; but we want men with money and brains to assist in the development of the whole country, and until we get them, and not until then, will Idaho be worthy of her appellation, "the gem of the mountains."

Nevada County and its Prospects.

A recent number of the *Nevada Transcript* says:

The county of Nevada is in size about the same as the State of Rhode Island, having an area of nearly 1,200 square miles. Its surface is generally mountainous or hilly, with occasional fertile valleys between. The soil is of a reddish color, and it is mostly side hill or table land. With irrigation, a great portion of it will produce almost any kind of crops. There is at present, however, but a mere tithe of the land cultivated. Last year it was estimated that only 16,000 acres were used for agricultural purposes. Doubtless when the railroad is completed a greater area will be cultivated.

Agriculture.

As fine potatoes as can be grown in the State were raised here the past season. There are thousands of acres of land adapted to their cultivation, which is conveniently located for irrigation, yet there were only 3,000 tons raised in all the county last year. Much of the soil is also adapted to the production of wheat, barley and hay, even without irrigation, yet there was not half enough produced to supply the home demand, and the balance had to be furnished by ranchers from near the valleys. The county only produced last year about 3,000 tons of hay from about the same number of acres. One-half the same area sown to alfalfa would produce double the amount if convenient to irrigation. The soil and climate are well adapted to

Fruit Growing.

And the fruit is acknowledged to be superior to that grown in the valleys, yet in all the county there are only a little over 400,000 trees and vines of every kind. In all the lower and middle portions of the county trees grow luxuriantly and produce bountifully with but very little care and cultivation. Fruit growing can be made an important industry, and one that will prove remunerative as soon as means to ship to market are furnished. Nut bearing trees seem almost indigenous to the soil. They grow rapidly and bear liberally, but there are as yet few planted. There are in the neighborhood of 1,200 miles of mining and irrigating ditches, along the line of which are opportunities of irrigating ten times the soil now under cultivation without materially interfering with the supply necessary for mining.

The Population of the County

Is something less than 20,000, and its assessed value of property is less than \$9,000,000. Quartz mining is the leading interest in the southeastern part of the county, yet there are but 43 mills in operation in the county. There are ledges in every direction, yet unworked, however, and it is expected the new process of Fryer will in a few years enable four times the present number worked to be properly developed. The whole upper portion of the county is clothed with pine, spruce, fir and other trees adapted to the manufacture of lumber, yet there are only 27 saw mills in operation, and only 50,000,000 feet of lumber sawed and 25,000,000 shingles made annually. There are over 100 miles of ancient river channel which are

Rich With Precious Metals

Within the borders of this county, yet there are probably less than ten of them even commenced to be worked. From the above facts we feel justified in saying that the natural resources of the county are not excelled by any similar one in the State; and but comparatively little has yet been done to develop them; that the field for enterprise here presented is superior to any section, and that in the near future, when it becomes known, capitalists and men of small means will avail themselves of the splendid opening awaiting their investment. The county is capable of supporting tenfold its present population. The prospect at present is certainly very flattering for the unparalleled prosperity of this section, and we see nothing to prevent the county from becoming second in importance in wealth and population only to but very few in the State.

A HORSELESS WORLD.—A Western paper amuses itself in this way: What a queer world it would be! No dry horse or cart horse in the streets; no race horse sweeping over the track; no cavalry horse on the battle-field; no lady's palfrey proudly prancing; no mustang on the plains; no Shetland pony; no Canadian sleigh horse; no canal boat horse nor artillery horse; no stallion in Kentucky; no horse for Sheridan to ride, or Grant to drive or Mazepa to fly with. A horseless world wouldn't be the world to which we have been accustomed. We should miss the kindly face of the animal which has been called the "friend of man;" which has served him so faithfully; which has performed the hardest work for him; which has helped him to fight his battles; which has done so much to render life enjoyable, and which has been so cruelly created by the hard-hearted.

MECHANICAL PROGRESS.

Vegetable Fiber for Plastering.

Notwithstanding it is well known that the animal hair used in mortar for plastering ceilings is soon destroyed by the caustic action of the quicklime, its use for keeping plaster together has been persisted in from time immemorial. This is so much more surprising, as it is well known by all who handle acids and alkalis, that the latter act in an opposite way from the former on vegetable and animal fibers; while mineral acids, like oil of vitriol, etc., do not attack animal substances like hair, the mineral alkalies, as potash, soda, lime, etc., do so; but on the other hand, they do not attack vegetable fibers, which are as safe against caustic alkalies as animal fibers are against acid. Therefore quicklime acts on hair in a similar way, and more so in proportion as it is more caustic; of course the hair used soon becomes rotten, and very often does not prevent the plaster from falling off, as is well known by those in the business.

At last the idea was conceived of substituting a vegetable fiber for the hair, which was so successful that the invention was patented, and after experimenting with various kinds of vegetable fibers, it is now prepared and furnished to builders, masons, plasterers, architects, and contractors.

Every one knows that the animal hair, as sold to the trade, is very impure, containing some 30 per cent. of its weight of impurities, as lime and scrapings of hides, while the hair itself, by the caustic action of the quicklime used in the process of removing it from the hides, has been greatly damaged and lost some 50 per cent. of its original strength. The objections to the hair thus far used are: 1st. It is more than half rotten by quicklime when bought. 2d. It can not resist the action of the lime in the plaster, but soon rots entirely away. 3d. It contains at least 30 per cent. of dirt and dust. 4th. Besides this loss in quantity, there is much short hair which is of no use in the plaster.

This new material is sold in New York city, under the name of the patent vegetable plastering fiber. The advantages claimed for it are: 1st. Being of a woody nature, instead of being destroyed when put in the lime, it is preserved—lime being a preserver of wood. 2d. It is light and bulky, so that one pound, costing only 20 cents, is sufficient for a barrel of brown, and two pounds for a barrel of lime scratch coat. 3d. It is much stronger than hair, is very light, clean, and perfectly free from dirt. 4th. It mixes more easily and freely with the plaster than is the case with hair, and also spreads much more evenly through the same. This substance is packed in bales of two pounds each, ready for use, and has only to be whipped a little to lighten it up, and scattered over the lime, which should be first thoroughly slacked.

Application of Solar Heat to Industrial Uses.

A Mr. Monchot has just invented a machine composed of three principal parts, to-wit: a metallic mirror with a linear focus, a blackened boiler whose axis coincides with this focus, and a casing of glass permitting the solar rays to come to the boiler but opposing their egress until they have been transformed into obscure rays by the latter. The opening of the mirror, which is in the form of a truncated cone, is turned toward the sun. The sides of the cone make an angle of 45° with its axis. The bottom of the mirror is composed of a disc of cast iron, which has for its object the diminution of the force of the wind.

The boiler, which is of the same height as the mirror, rises from the center of the disc, and is of copper, blackened on the outside. It is composed of a double casing, between the inner and outer of which is the feed water.

The following is one of the results obtained with this apparatus under ordinary circumstances, to-wit: 20 liters (1,220 1/2 inches) of water were introduced at 20° (68° Fahrenheit); in 40 minutes they produced steam of two atmospheres, and a few minutes later of five atmospheres. The steam served for the working of several motors.—*American Manufacturer.*

PLATING COPPER AND BRASS.—Copper or brass, says Armand Bertrand, may be plated with bismuth in a bath composed of 25 or 30 grammes of ammoniacal chloride of bismuth per liter of water, slightly acidulated with hydro-chloric acid, operated cold. If heated to 100 degs. the bismuth will not deposit. A single Bunsen cell only is necessary; with a single Daniel cell the deposit is long forming and but slight. On coming from the bath, the articles are covered with a dark deposit, under which is the bismuth with its especial brilliancy, and adhering strongly. By substituting the double chloride of antimony and ammonium, antimony may be similarly deposited.

A NOVEL MODE OF WELL BORING.—In various parts of Scandinavia the boring of artesian wells is done by means of a jet of water. The stones in the diluvial ground, which are a great hindrance to such operations, are thrust one side by the jet, if small; while if large they are shattered by dynamite. In Kiel 22 artesian wells have been bored within the past six or seven months.

Combined Steel and Iron.

In addition to the advantages alluded to last week as derivable from Wheeler's new mode of welding steel to iron, we may mention, as of great importance, its application to the manufacture of fire arms—both small arms and cannon of the largest caliber. Mr. Wheeler holds that the past manner of casting cannon, in not excluding the atmosphere from the mold while molten metal is being poured in, accounts for the brittleness of the gun metal in general, and its lack of resisting force to a great expansive power.

Hitherto the great problem has been to discover a gun that would be light and economical and at the same time capable of great endurance. The best known cannon now in use is the Armstrong gun in England. This inventor, after spending hundreds of thousands of pounds for the government, brought out a gun that secured him a knighthood. The Armstrong gun is of iron entirely. The great trouble with an iron gun, however, lies in the fact that it is subject to abrasion from the friction of its load, so that in time it becomes very inaccurate from irregularities produced upon the surface of its interior. A steel surface is necessary to guard against this abrasion, but a gun made entirely of steel has no resisting strength, as compared with an iron gun. The famous Krupp gun of Germany is a steel gun, but it sometimes bursts after a second discharge, as was the case with the last experiment made with a gun of extraordinary caliber. For years the great problem has been to combine steel with iron so that a gun might be found that will have a steel lining for its interior, to prevent abrasion, and iron exterior to secure the desired strength. Steel is also much more expensive and heavy than iron, so that an iron gun with steel lining would of necessity be lighter, more economical and effective than could any of the guns made of steel alone. It would also have a strength far superior to the best Armstrong gun. To solve this problem has required the welding of steel and iron in such a manner that a homogeneous mass would be produced, combining the desiderata of good qualities. Hence Mr. Wheeler's combined iron and steel plan has been called the Armstrong married to the Krupp. It is the successful solution of a problem upon which the warlike nations of the world have expended millions without, heretofore, any very satisfactory result.

In regard to small arms it is said that Remington, Sharp, and Mrs. Colt have made overtures to use the process in the manufacture of their weapons. It is claimed that the invention, so long sought after, is but another discovery of the identical process used in the manufacture of the celebrated Damascus blade. Certain it is that all the leading naval officers, from Admiral Porter down, are very enthusiastic upon the subject of this improvement.

THE CONSTRUCTION OF REVOLVING DRAWBRIDGES.—Mr. Clemens Herschel has presented to the American Society of Civil Engineers a paper on the principles of the construction and calculation of the strains in revolving drawbridges, and his work has an important value as one of practical interest to the profession of engineers. The calculation of continuous girders was first undertaken by Navier in 1830, but was much improved upon by Clapeyron in 1857. These and other authors have, however, Mr. Herschel states, developed only special cases, and he has undertaken to develop the equations for the general case of unequal spans and supports, either in or out of level. Following the equations given in a recent work of Weyrauch, Mr. Herschel gives in detail the formula necessary to compute the dimensions of every part of the bridge in question, and illustrates the whole by numerical examples. The several equations are written out in full, and are so clear as to enable any one to follow the processes with ease. A couple of tables, showing the strains experienced by every portion of a bridge under certain loads, gives a very lucid view of the relative strength demanded in the various portions of the structure.—*Iron Age.*

LOSS OF POWER IN THE STEAM ENGINE.—The following table, from an article by Messrs. Hunt and Skeel, on "The Methods of Testing Steam Engines," gives a good idea of the quality and amount of the losses, in the case of a condensing engine connected to a propeller:—

Units of heat in 100 lbs. anthracite.....	1,400,000	
Heat equivalent to weight of ashes.....	200,000	
Total heat in 100 lbs of anthracite.....	1,200,000	100
Carried off by hot gases in chimney.....	200,000	16 2/3
Available to produce steam.....	1,000,000	83 1/3
Lost by leakage and condensation.....	200,000	16 2/3
Available for work in cylinder.....	800,000	66 2/3
Escaped with steam into condenser.....	600,000	50
Transformed into work.....	140,000	11 2/3
Absorbed by friction, etc., of engine.....	40,000	3 1/3
Available for useful work.....	100,000	8 1/3
Absorbed by friction, etc., of propeller.....	20,000	1 2/3
Usefully applied to propulsion.....	80,000	6 2/3

FIRE-PROOF JOIST.—An ingenious kind of fire-proof joist, recently introduced, consists of a slip of wood five inches wide by five-eighths of an inch thick, belted between two flanged strips of quarter-inch iron, making a beam quite as strong as those of wood ordinarily employed. The iron sides, in addition to affording strength, it is claimed, render the joist substantially fire-proof, while the center of wood affords the means of putting down floors and nailing on laths in the usual manner. The impediment to the manufacture of these joists heretofore has been the difficulty of rolling the flanged iron sides, but this has now been successfully overcome.

SCIENTIFIC PROGRESS.

Chemistry in its Relation to Modern Thought.

The above was the title of a paper read by Mr. H. B. Baildon before a meeting of the North British branch of the Pharmaceutical Society, held in Edinburgh recently. In the course of his remarks the reader showed that to chemistry was entrusted the task of tracking matter back to its simplest form or forms, and the result, so far as present knowledge went, was remarkable. There were over 60 elements which had hitherto defied all attempts to resolve them into a further simplicity, and these were indestructible, passing seamless and invulnerable through every transformation. While of course it was open to the theorists to hold that these elements were varieties of some ultimate single substance, there seemed no prospect that a proof would ever offer itself. No doubt the fact that all the elements had different atomic weights, and that in some cases we found elements which bore a family likeness, forming a series in regard to their atomic weights—affording, as it were, a glimpse of the wondrous staircase of creation; yet as there appeared to be no means of further analysis, this theory seemed fated to remain a theory. Like all sciences, chemistry was full of unanswered questions. Mature and elaborate as it was, it had not surrendered the keys of its causation. We might talk glibly enough of chemical affinities though we could give no reason for them. It was possible that at some future time a further step might be made; some relation between the form of the molecules and these affinities might be discovered. But it seemed certain, from all previous experience, that, virtually, the same question would remain unanswered—a law being found according to which the molecules attract each other, but for whose existence no reason could be assigned. Passing on to inquire what bearing chemistry had upon Mr. Tyndall's notion of matter, the professor found in matter, firstly, the "promise of all terrestrial life." Did that mean there was nothing but matter in existence? If so, it was contradictory to the professor's own admission of the mystery of mind. Did it mean that the material or physical universe consisted of matter? That was tautologic. Or did it mean that matter traced back to its simplest forms gave promise of its future destiny? If so, this last could flatly be denied. Matter in its simplest forms consisted of a number of separate elements. So long as these were kept apart, they exhibited peculiar and distinct properties. But take two whose single properties were known, and allow them to combine, when there appeared what was virtually a new creation—a substance possessing qualities different from those of its constituents. Neither of these, therefore, could he said to afford the promise of the resulting product. After a reference to the law of combination by weight, the reader treated of a combination by volume, diffusion of gases and crystallization. He concluded by saying that to his mind the fact of crystallization was higher than that of any law they had yet dealt with; it declared most distinctly the connection between beauty and purity, the tendency of the crystal being to cast out all chemical impurity.—*Iron.*

THE scientific report of the Austro-Hungarian Arctic expedition represents the effect of extreme cold upon the human body in high northern latitudes as usually much exaggerated. Among the sailors there were some who did not wear fur coats at all, and even in the coldest weather they smoked their cigars outdoors. It is only when accompanied by wind that the cold produces serious discomfort; but the violent winds common in southern climates are unknown near Francis Joseph's Land, the northernmost country yet discovered on the earth. The belief that the polar ice tends strongly to calm the winds is commonly entertained by Arctic sailors. Among the more remarkable discoveries made by Lieutenant Weyprecht is a curious fact about the drift of Arctic ice; it does not drift straight before the wind, but invariably deviates to the right, looked at from the center of the compass. The deviation cannot be accounted for, either by the conformation of the neighboring coasts, or the existence of currents which might produce it, as it occurs with winds blowing from opposite directions.

FORMATION OF SUGAR IN BEETS.—The discussion on the subject of the formation of sugar in beets continues to be warm, but is very far from having a satisfactory conclusion. The great authority, Claude Bernard, is of opinion the sugar is formed by the root. Messrs. Duchartre and Viollette believe it takes its place by the leaves, owing to the conversion of the starch in the leaves into saccharine matter, the root being merely the depot for the sugar thus formed, to nourish the seed stem the following year, just as the tubercle of the potato has a store of starch to feed its shoots of the succeeding season.

ORGANIC ELEMENTS AS ELECTRO-MOTORS.—It appears, from the author's researches, that the interior of a muscle is negative, which indicates that there is oxidation in the interior and reduction at the exterior, and that all organized bodies appear formed of—so to say—an infinite number of electro-motors, which intervene probably in the phenomena of nutrition.—*Becquerel.*

Formation of Ultramarine During the Incineration of Bread.

I do not find any note of the fact that, at a certain stage in the incineration (burning) of bread, the beautiful ultramarine blue is formed. This occurs under circumstances which I have not yet sufficiently studied to enable me to reproduce it with certainty; but if the heat be raised to very bright redness, or be prolonged after complete incineration of the bread, the blue passes into a beautiful turquoise color, then becomes green, then passes on into a rusty color, and finally comes out as a pale fawn-colored lining to the botryoidal mass of ash. This is not further affected, even by a prolonged white heat. The tints are so suggestive of the presence of copper that only by very careful examination did I satisfy myself of the absence of that metal; and I find that the colors occur in the purest and finest bread, as well as in inferior samples. I should be grateful if other analysts would favor me with any observations which they may have made upon this point, and I hope soon to be in a position to submit for myself some further account.

It is curious that copper should appear in all the text books as one of the agents ordinarily used for adulterating bread, and the question arises whether the supposed use of copper may not sometimes have been erroneously inferred from the occurrence in bread ash of these beautiful colors.—*James Edmunds, in Chemical News.*

GEOLOGY AND THE BLAST FURNACE.—Geologists have given us as a theory for the creation of columnar formed trap rock that it is of igneous origin. Prof. James D. Dana says: "While stratification has come from the successive formation of beds these columns are a result of the cooling. Cooling causes contraction of the solid rock, and as cooling went on produced the fractures. These fractures are always at right angles, or nearly so, to the cooling surfaces. Where the rock fills the vertical fissures the columns are horizontal. Even sandstones have been rendered columnar where overlaid by beds of trap, or when they have been subjected otherwise to heat." Electricity and motion have also been given as causes of the columnar forms of rock, but as another evidence of the correctness of the former theory it is stated now, although it has been long known to blast furnacemen, that "the sandstone bottoms of iron furnaces assume, from the long continued action of heat, a distinctly columnar form, the old lines of stratification being obliterated, thus showing that heat, as well as electricity and mechanical force, was an agent in the production of the columnar form of rocks." And thus work of man is quoted to illustrate and prove the workings of nature.—*American Manufacturer.*

NO REST.—Science teaches us that the crust of our earth is perpetually moving, and that the sea level is constantly changing. Our globe has its daily rotation on its axis and its yearly revolution about the sun. The sun, with all its satellites, sweeps on toward a moving point in the constellation Hercules. Every so-called fixed star is in motion. Fifty thousand years ago the constellation of the Great Bear or Dipper was a starry cross; a hundred thousand years hence the imaginary Dipper will be upside down, and the stars which form the bowl and handle will have changed places. The misty nebulae are moving, and besides are whirling around in great spirals, some one way, some another. Every molecule or matter in the whole universe is swinging to and fro; every particle of ether which fills space is in jelly-like vibration. Light is one kind of motion, heat another, electricity another, magnetism another, sound another. Every human sense is the result of motion; every perception, every thought is but motion of the molecules of the brain translated by that incomprehensible thing we call "mind." The processes of growth, of existence, of decay, whether in worlds or in the minutest organisms, are but motion.—*Scientific American.*

SCIENCE IN THE PUBLIC SCHOOLS.—At the close of his series of six Christmas lectures, in London, on electricity, Prof. Tyndall remarked that five of them had been illustrated with apparatus which any teacher could make of the commonest material, at scarcely any cost. He hoped the example thus set would be followed, for the future of science depended to some extent on teachers in the public schools. The masters of schools, he said, should look the problem of scientific education straight in the face, for science was growing day by day and hour by hour, and although he would deprecate any change from without in the public school system, he would advise the masters to make the change from within, before the outside pressure became too strong.

PURIFYING COPPER.—A process has been patented by Mr. S. L. Crocker, of Taunton, Mass., which consists in adding zinc in small quantity in a furnace to the copper ore or ores, or to the partially refined metallic copper therein, containing arsenic and antimony, whereby, it is claimed, those impurities can be readily removed.

CONSOLIDATING ASHES.—The discovery of a process by which ashes can be converted into a solid mass as hard as marble has revived the discussion of cremation in Germany.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

California.

AMADOR.

WILDA MINE.—*Amador Ledger*, Feb. 19: The supply of wood is about exhausted at this mine, and the work of taking out rock has been suspended in consequence. Most of the miners have been temporarily discharged. The principal work at present carried on is the hauling of water. The roads are in such a condition that wood cannot be obtained to keep the mine in full operation.

BARROW MINE.—This mine, situated near Drytown, has been idle for years. We now hear that Hayward has bought a large interest in it, and that it will shortly be started up. The recent splendid developments in the Gover mine, in the same locality, has drawn attention to this abandoned claim, and there is every probability that it will be put in working order in the spring.

CONGREGATED.—The mill of the Amador Consolidated mine was started up on Saturday, for the first time since the fire. They are running 20 stamps, on rock from the old Badger-shaft. The tunnel is almost through. In crossing the middle shaft it was found to be filled up with earth, timbers and mining debris of all sorts. The prospects of the mine are decidedly bright.

NECROT.—David Brown, the other day, picked up a handsome nugget of gold and quartz on Sutter creek, about two miles above the town. It is worth \$9.

NEW QUARTZ LEDGE.—Messrs. McIntyre, Burleson and Hayden, of Sutter Creek, have commenced prospecting on what appears to be a new ledge, a short distance west of the Amador Consolidated mine.

The ledge is a vein of quartz, and is covered 12 feet thick, showing sulphurets and some free gold.

NEW CLAIM.—Holmer Turner, Charles Stecker and others, this week took up a placer claim situated about half a mile north of the quartz claim located by them last week.

SHARP & BOXALL CLAIM.—Two miles of flume has recently been constructed to supply this claim with water from the Butte ditch. The hydraulic operations are much retarded by the caving of the ground.

THE BONANZA CLEAN UP.—The clean up at the Bonanza mine of Drytown turned out well, realizing \$1,800, an average of \$5 per ton. They will clean up again at the end of the month. This may now be regarded as one of the paying mines of the country.

BUTTE.

SALE OF DITCH PROPERTY.—*Butte Record*, Feb. 19: The West ditch, which takes water from Butte creek, near the site of the old Neal saw mill, and conveys it to Thompson's flat, has recently been sold to C. B. Powers, F. B. Miller and J. T. South. In connection with the ditch were some 1,400 acres of land, lying along the north bank of Feather river, opposite Oroville, and being part of the Fernandez grant, sold in connection with the ditch. The sum paid for the property is said to be \$45,000. It is possible that a portion of this ground may prove moderate mining ground, but we should judge the whole thing was put up to sell in a desperate manner.

The original corporators and fell into the hands of their hired superintendent. The Fernandez grant was a floating swindle that was located partially on mining ground, and confirmed by government through the influence of a former U. S. District Attorney, to himself and others. The ground has been mined for years and never made as successful a clean up as the present reported sale. We supposed it is to be rendered profitable as was the Emma mine, by working it off in England.

CALAVERAS.

NUOGET.—*Calaveras Chronicle*, Feb. 19: A nugget of gold was picked up on Marietta street on Friday of last week by Mr. Charles Page. This place, the streets of Mokelumne Hill resemble those of New Jerusalem in more respects than one.

CONTRA COSTA.

EMPIRE COAL MINE.—*Antioch Ledger*, Feb. 19: The proprietors of this valuable mine, Messrs. Rouse & Harburt, are pushing ahead preparatory to shipping coal as soon as the roads are passable for heavy freight. The main shaft is now down 525 feet, and the force of men employed, 30 in number, are running gangways and air shafts. The coal is of excellent quality, and the vein perhaps the largest that has been discovered on the coast. Work has already commenced on the new county road leading to the mine, and it is believed a railroad will also be completed from the mine to Antioch during the summer.

INYO.

DARWIN DISTRICT.—*Coso Mining News*, Feb. 17: In the Delance mine work in all the drifts and levees as mentioned in our last issue, is being vigorously prosecuted, and at all points we have inspected the mine is constantly improving to a wonderful degree, particularly in the drift being run from the bottom of the south winze, which is the deepest working on the mine, being about 110 feet below the croppings.

DEFANCE FURNACE.—The furnace has been running very successfully for the past 10 days, and is fast to make an extended run, as everything is in fine working order. The weather being warm and pleasant the snow in the mountains is fast disappearing and very little more trouble is apprehended as to a further and sufficient supply of coal. During the nine days actual running time 974 bars of bullion have been made, 874 which have been shipped. There were on hand last night 100 bars. The bullion is gradually increasing in richness of silver.

CUERVO FURNACE.—The Cuervo furnace has not been running during the past week for the reason, we are informed, that no coal is obtainable just yet.

NEW COSO FURNACE.—The furnace is running very well indeed, and turning out large quantities of high grade bullion.

GOLD DISTRICT.—Some two miles south of Lookout is a gold district, the formation being granite, while that at Lookout is limestone. There are numerous locations made here of gold-bearing mines, and many of them are of much value. Specimens can be obtained which will assay all the way from \$40 to \$40,000 per ton. The lodes vary in width, ranging from a few feet to 100 feet. The croppings are traceable for long distances, and being in a granite formation, accompanied with porphyry dikes, there is hardly a doubt but that the ledge will go down to a great depth. Water is close at hand for steam purposes, and wood within three miles; and all that this portion of Lookout district needs to make it the peer of any in Inyo county, is capital for the development of the mines and reduction of the ores.

HEMLOCK (PANAMINT).—From Judge J. M. Murphy, who called at our office the latter part of last week, we learn that a big strike has been made in the Hemlock mine, at a depth of nearly 500 feet, a solid body of pure black metal having been discovered which is three feet in width, the ore averaging \$400 per ton. Considerable excitement was caused in the camp in consequence of the strike.

LEE DISTRICT.—Geo. M. Frink, son of J. B. Frink, came in from Lee district yesterday and informs us that the timber frame for the Emigrant company's mill is all on the ground awaiting the arrival of the machinery, which has been lying at Caliente for the past month.

MONO.

BENTON.—*Cor. Inyo Independent*, Feb. 12: Both mills

are shut down at the present. Mr. Mack's mill has not been running for some time for the want of ore, as erecting the hoisting works and laying new track prevented getting ore to the surface. The Diana mill has been undergoing a thorough repairing under the supervision of Mr. Julius Partz, and will start up to-morrow, and as the mines are looking well, the mills ready to start and as the weather coming, we may expect to see a few "Benton bits" in circulation. Messrs. Thompson & Triman have about completed their astrata at Moore's creek, when they expect to be able to run three tons of ore in 24 hours, and as their ore is quite rich and free from base metals we do not see anything to prevent them from realizing a handsome profit on the venture. Mr. Partz, a Montgomery canon, has lately struck a vein of ore about one foot thick and said to assay in the thousands, but we do know if Mr. Kays has very much ore of the specimen he exhibited here a few days ago, he is fixed for the Centennial.

NEVADA.

PROSPECTING.—*Nevada Transcript*, Feb. 19: There is considerable prospecting going on in the county, but a large number who claim ledges are waiting for further developments of the Fryer process. They have claims on ledges which they can hold, and do not choose to do more work until they are perfectly satisfied that rock can be more cheaply reduced than by the present methods.

NEW LEDGES.—Three miners commenced some time since to prospect a ledge located near the corner of the old Nick Turner lot, beyond Plety hill, and are now drawing the rock to Kitts' mill to be crushed. They have sunk 40 feet on the ledge, and then drifted far enough to get out a ton of rock, which will now be crushed. The rock shows considerable free gold. The ledge is in the neighborhood of a foot in width, and it is thought will be proven by the crushing to be valuable.

BAY'S RANCH MINE.—*Foothill Tidings*, Feb. 19: The Bay's Ranch mine is now being developed for the purpose of finding what the ore will do by the Fryer process. The description of the rock, which will now be paid well, but the rock below the water line was more refractory and failed to pay by common mill treatment. The new method of working is bound to bring out many a mine now considered worthless.

The Franklin, Allison Ranch, mine is looking up in the estimation of the public, and the owners are about to erect steam works thereon and thoroughly open it up. It is thought to prove equal to the old Allison Ranch, as its friends claim it may, that region will once more be alive with busy miners.

The prospect is that the Prospect company have a fine mine in the old Perseverance, down below Allison Ranch. Stock in this company which went begging for buyers at the value of the assessments which had been levied thereon, only a short time since, is snapped up now around \$100 per share.

OSAHIA.—A new water wheel is being built at this mine to cheapen and facilitate the work on mine and mill, and the general outlook for this company is good. Big clean-ups are getting to be the regular thing at the Omaha.

EMPIRE MINE.—Late developments in this mine are the most encouraging nature. The Empire is now working the best in the county. They are now working a large force and splendid returns may soon be looked for. It is thought to be a No. 1 mine.

PLACER.

A FINE NUOGET.—*Placer Argus*, Feb. 19: We saw a nugget yesterday at Andrews & Hollenbeck's bank that was enough to recall the olden time when gold was plenty in the ravines around Auburn. It was the property of Juan Romero, who found it while mining in Baltimore ravine. It was of irregular shape, almost as large as a man's fist, and weighed 23 ounces and 15 pennyweights. It proved equal to the old Allison Ranch, as its friends claim it may, that region will once more be alive with busy miners.

SAN BERNARDINO.

Los Angeles Land Journal, Feb. 15: There is a prospect of the early resumption of operations in the Temescal tin mines in San Bernardino county. These mines are situated on the south side of the San Bernardino settlement known as Pomona. During the past 10 years but little labor has been performed in these mines on account of a conflict in regard to the title. The property is reputed to be immensely valuable, and it is unfortunate that an industry of so much importance should languish on account of a wrangle over the right of possession. But it appears that the conflicting interests will soon be smoothly adjusted, and that a company of foreign capitalists will vigorously take hold of the work. The prospective operators are wealthy gentlemen from Amsterdam, who are engaged in importing tin from the United States on an extensive scale. The value of tin annually imported by them is given at \$14,000,000. It is stated that they have secured a large tract of land, and that the money will be paid on the 1st of May next, and it is believed that the resumption of mining operations will greatly benefit business and property interests in that section.

SISKIYOU.

SALIVATON.—*Yreka Journal*, Feb. 19: The quicksilver mining company in Trinity valley has shut down on working any more cinabar this winter, being unable to procure hands, as several have been salivated, owing to the mortar used in the brick retorts, having been made from the tailings of the cinabar. The furnaces have been shut down, and the mortar will be replaced, and then the cinabar tailings, in order to get the men to work the retorts. The contracts for lime and other supplies from Scott valley, however, continue the same and will be fulfilled as contracted. When new retorts are built, the work of retorting will go on again with still greater success.

MINERS.—On Patterson creek, in Scott valley, more ground sluicing and hydraulic mining has been done than during any winter since the claims have been taken up, and work will be continued, undoubtedly, all summer, which is an unusual occurrence on that creek. A large amount of gold will be taken out this season, which will make times lively and prosperous in the neighborhood. On Cherry creek and Deadwood, the miners are busy with a better supply of water than for many years, and plenty of snow on the hills to keep it up until late in the summer. At Indian creek and Oro Fino, the cold weather stopped the supply by freezing, but as the weather is warm again, there will be an abundance to permit successful hydraulic mining, ground sluicing and other methods. The miners are busy with a better supply of water, and are working every day, Sundays included, and some of them nights also, when the weather permitted, in moving down great banks toward reaching the rich bedded gravel. On Humbug creek the miners are also busy, and have an abundance of water for ground sluicing and hydraulic mining, and the prospects of a big supply all summer from the west are very bright. The miners are busy with a better supply of water, and are working every day, Sundays included, and some of them nights also, when the weather permitted, in moving down great banks toward reaching the rich bedded gravel. On Humbug creek the miners are also busy, and have an abundance of water for ground sluicing and hydraulic mining, and the prospects of a big supply all summer from the west are very bright.

TRINITY.

THE OUTLOOK.—*Trinity Journal*, Feb. 19: In a mining point of view the present winter is decidedly the best experienced in this section. The water supply commenced earlier than usual and has kept up continuously, with a certainty of lasting longer than for many years. The mountains are covered with snow many feet deep, and we would not be surprised to see some on Old Baldy later next summer than ever before. The storms have come with such regularity and at such op-

portunity times, that we don't believe the miners themselves could improve on the present season, even had they the power to control the elements. Cold weather has not in the least interfered with the working of the mines, and in fact, everything in the weather line has been just as good and beneficial as possible. The miners, on one end of the county to the other, are improving their time and the splendid opportunities presented by the favorable season. Many of them run continuously, and there are none but who have done much more work already than all of last year. As indicated by the few partial clean-ups so far made, our mines should yield as much this season as they have during the past three or four combined. Certainly a claim which will not pay under the present favorable circumstances had better be abandoned. The "oldest inhabitant" has never experienced a mining season which in point of excellence could be compared to this. Let us be thankful, and joyfully await the result.

LEWISTON MATTERS.—The miners at Lewiston are all running with a full supply of water. This promises to be an exceptional year with the miners of that locality, who will not only meet the present favorable circumstances but will have found a deep back channel on one of the bars of Deadwood creek, which prospects excellently. We hope "Duffy" will not be disappointed in his expectations. Paulsen & Christensen will convey their Rush creek water across the river this summer, to be used on the property recently purchased from Harrison Fox. The water will be used for irrigating in the summer months and leased to miners during the winter. They will convey it under the river through iron pipes sunk in the bedrock, forcing the water through by hydraulic pressure, and giving it about 25 feet fall. They intend after preparing the pipe with coal tar, to sink it in the ground the entire length, holding that it will not be so subject to atmospheric influences by this procedure. They estimate that about 1,500 feet of 15 inch pipe will be required.

TUOLUMNE.

LADY WASHINGTON MINE.—*Sonoma Democrat*, Feb. 14: This mine, situated near Summerville, will commence running on Monday next, there being about 300 tons of rock out for crushing and the mill working 10 stamps. Calhoun Dorsey, Esq., the owner, has constructed a tramway of wire 2,400 feet in length, from the mine to the mill, the former being 750 feet above the latter, by which cars can be sent down every four minutes, being hauled back with a dummy engine. When Mr. Dorsey first proposed this continuous unsupported wire tramway, everybody predicted that it would be a failure. The distance they said was too long, the weight of the wire alone was sufficient to break it, and as for running loaded cars over it, that was impossible. They take it all back now and gaze with wonder at the novel spectacle of a box full of ore swinging through space along 2,400 feet of wire. Mr. Dorsey intended to place another wire in position shortly, so that loaded cars going down can return the empty cars to the mine. The mine is looking well.

Nevada.

WASHOE DISTRICT.

SAVAGE.—*Gold Hill News*, Feb. 17: Every effort is being made to reduce the water in the shaft. During the fore part of the week it seemed as if the pumps and hoisting tanks would be successful, as the water was lowered some 30 or 40 feet in the shaft. Yesterday, however, the water again rose to the 1800-ft level, where it yet remains.

KOSUTH.—Sinking the shaft is making excellent progress, the bottom in good blasting ground. The main south drift, at the 350-foot level, is made up of quartz, the face of the quartz and ore of a much better character than any heretofore encountered on that level. This drift does not have very much further to run to reach and tap the chimney of good ore found on the level above.

YELLOW JACKET.—The east cross-cut from the bottom of the south winze on the 1540-ft level is in 74 feet. The small cross-cut going east from the latter drift, connecting with the north and south winzes is in 42 feet. The east cross-cut from the bottom of the north winze, on the 1940-ft level, is in 120 feet. The faces of these several drifts are all in porphyry carrying occasional seams of quartz.

AMAZON AND GLACIOW.—Grading and enlarging for the foundation of a larger hoisting engine, and more extensive pumping machinery is making rapid and the most possible. Nothing further can be done in the mine until the machinery is ready to extract the water struck a few days since.

CALIFORNIA.—Sinking the winze below the 1500-ft level, in cross-cut No. 5, 100 feet south of the north line, is making excellent progress, the bottom still in ore. The small cross-cut reaching the 1550-ft level, is to continue directly downwards as an air winze for an indefinite depth, and will make the third winze sunk in the great ore body below the 1550-ft level. The first was on the Consolidated Virginia ground, and was sunk to a depth of 148 feet below the 1550-ft level, all the way in rich ore. The second was sunk 100 feet from the south line of the first ore body, and was sunk to a depth of 127 feet also in rich ore. The sinking of both of these winzes was stopped by water. The main north drift on the 1550-ft level, known as drift B, running to connect with the winze being sunk below cross-cut No. 6 on the 1500-ft level is being pushed vigorously ahead, the face in ore, the richness of which we may almost say is without a parallel, even in the rich ore of the Washoe district. The face in quartz and ore is being pushed to completion with all the energy possible. A large and commodious office is being erected near the works. The new air compressor is nearly ready to start up, and everything is fast assuming the best shape possible for a good spring and summer work.

UTAH.—The main west drift on the 400-ft level is badly caved, cutting off the ventilation afforded by the old upper shaft. The repairs to this drift are progressing rapidly, and it will not take long now to fully restore the old means of ventilation, and have everything in that portion of the mine again in good working shape.

RED AND WHITE CROSS.—Sinking the shaft is resumed. The shaft is being pushed ahead, the bottom indicates a near approach to paying ore. A contract is let for the requisite timbers, and as soon as they are received they will be put into the shaft.

JULIA.—Sinking the shaft was stopped during the fore part of the week, on account of having reached the full length of the present cables, others having been ordered. The new cables are being made in quietness, and have been built purposely for the reception of the new cables as soon as they arrive, which will be in a day or two more. This shaft has now attained the depth of 1680 feet, being the deepest perpendicular shaft on the lode. The main southwest prospecting drift on the 1600-ft level is advancing at the very rapid rate of eight feet per day, the face in quartz and ore being pushed to completion with all the energy possible. A large and commodious office is being erected near the works. The new air compressor is nearly ready to start up, and everything is fast assuming the best shape possible for a good spring and summer work.

LADY BEXAN.—Sinking the main shaft is going ahead rapidly, with no new or important features to report. The two west cross-cuts on the 170-ft level are steadily advancing, No. 1 still showing some excellent ore. On the 350-ft level the face in quartz and ore is being pushed ahead, while at the same time five cross-cuts are being run at different points to cut and prospect the ore vein. It is confidently expected that one of the drifts will in a very short time penetrate the ledge immediately under where the rich ore has been opened on the levels above, when some good developments may well be looked for.

CAWON POINT.—The main south drift on the 1600-ft level is steadily advancing, without any particular change to note during the week. The south winze, descending from the 1500-ft level to connect with this drift, will complete the connection in about 10 days, it yet having about 16 feet to sink to reach the 1600-ft level.

LADY WASHINGTON.—Sinking the shaft is resumed, and lively and effective work is being done working four six-hour shifts. A large amount of water comes in, but the powerful pumping apparatus disposes of it with the utmost ease. With the machinery, spacious and excellent buildings, fine, large, well located shaft and very encouraging developments, the present and future prospects of the Lady Washington mine are very favorable.

CALEDONIA.—Sinking the shaft has been considerably impeded during the past week by the steady, strong flow of water at the bottom. The water is handled with ease by the pumps.

SERRA NEVADA.—The north and south drifts, on the 1000-ft level, are making good progress. Both the south and north drifts, on the 700-ft level of the old shaft, are being driven vigorously forward. The face of each is in ledge material of a favorable character.

UNION CONS.—The north drift on the upper tunnel level is being driven steadily forward, following a fine streak of ore struck a few days ago. This streak of ore is from 10 to 18 inches in thickness, and is of a good quality and may yet lead to a large and valuable development.

BALTIMORE AND AMERICAN FLAT.—Sinking the main incline is making steady progress, the rock in the bottom blasting out finely. The east drift on the 1050-ft level is pressed steadily forward, the face in a very favorable formation, with strong indications of soon reaching the ore vein. The pumps are working well, and everything is in excellent order for a strong flow of water should it be encountered when the ledge is reached.

JUSTICE.—Good prospecting and ore development continues to be done at the 400 and 600-ft levels. The winze being sunk from the 600 to the 800-ft level will be completed to connection in two or three weeks longer, at the present rate of progress.

THE FLORENTINE.—The slow and slackened sufficiently to admit of a resumption of work in the face of the main east drift on the fourth station level. Sinking the main incline is going steadily forward, the rock in the bottom still being quite hard, and the water causing considerable trouble.

MINZ.—The putting in of the several stations in the pump shaft is making rapid progress. It has been found necessary to refit some 60 feet of the main shaft, where the timbers were pressed in by the heavy body of clay through which it passed.

IMPERIAL-EMPIRE.—Daily yield, 40 tons of ore. There is little or no change whatever in the general appearance of the ore breasts or quality of ore extracted. The north drift on the 2000-ft level is steadily advancing at the rate of four feet per day, the face in very favorable ledge material.

NORR DAVTON.—This is a very promising mine. It is situated just north of, and adjoining the Dayton mine. A tunnel has been run nearly 600 feet in length, cutting the ledge and exposing some fine ore.

ROCK ISLAND.—The shaft is down to the 850-ft level, at which point a pump station is being put in. As soon as the pump tank is completed, a station will be opened and a drift started at that point to cut and prospect the ledge.

HALE & NONCROSS.—For a day or two during the week the pumps and tanks gained on the water, lowering it a number of feet in the shaft, but yesterday the water rose in the shaft in spite of all opposition; and this morning it has reached a point above the 1800-ft level, as high as it has ever been, and has heretofore risen.

SUCCESS.—Sinking the shaft has been considerably delayed by the repairs to the pumping machinery, so that no headway has been made in that quarter during the week. The main west drift on the 550-ft level is showing some very favorable indications of ore.

CAROLINA.—The shaft is down to the 400-ft level, the average value of which is \$27 per ton. The Combination shaft is making steady downward progress.

NIAORA.—This mine is being put in good working shape, and will be started up in a very short time under the able management of S. L. Jones, the superintendent of the Crown Point.

PROSPECT.—The development of this mine is being pushed forward with great activity, and sinking the shaft and running the drift goes ahead with a will. The small rich streaks thus far passed through by the tunnel show conclusively that a large rich vein or body of ore is very liable to be met with at a greater depth, and that is what the shaft is intended to develop.

THE SHAFT.—The shaft is now down 350 feet. The flow of water is quite strong. Preparations are being made to put in pumping machinery of the same size and character as that employed in the C. & O. shaft.

PAUL SHERIDAN.—This company has purchased, for the sum of \$12,000, the titles of several contending claims, and are now at work repairing the hoisting works building with the intention of the development of the mine in good earnest. Mr. S. L. Jones is superintendent.

SULLIVAN.—Very excellent ore assays and prospects have been met with during the week in the east cross-cut from the main south drift. No sign of any east wall yet, the drift continuing in the regular vein matter. The eastern portion of the great fissure seems to be the main vein, and the drift is being run in that direction as by no means improbable.

DAVTON.—The north and south drifts on the 500-ft level are steadily advancing, running parallel with the ore vein. The pump station and hoist-pit at the 400-ft level are nearly completed.

SILVER CITY.—The ore slopes from the upraise, both north and south, are yielding plenty of good milling ore, which is accumulating on the dump. Another upraise is being made, 150 feet farther to the southward, in the vein, showing four feet of good milling ore. Will commence shipping ore to the Ramsdell mill to-morrow.

NEW YORK CONSOLIDATED.—The west cross-cut on the 800-ft level is being pushed ahead with all the energy possible to cut the ore vein.

BULLION.—Sinking the incline is going steadily ahead at the rate of four feet per day. The upraise from the 1700-ft level, to connect with the bottom of the incline, is making excellent progress.

NORTH CARBON.—Very satisfactory progress continues to be made sinking the shaft below the 200-ft station. The main north drift at the 100-ft level shows a continuation of the good ore heretofore mentioned.

ROVER AND READY.—The shaft is now 60 feet deep, and Superintendent Caldwell is sending it downward as fast as practicable. During the recent stormy spell of weather the work was kept going tight straight along.

SEATHAN.—Shaft sinking at the usual good rate of progress, the machinery working finely and no water to interfere. Another level is to be opened when the proper depth is attained.

OVERMAN.—Sinking the shaft is making steady progress, notwithstanding a strong flow of water from the bottom.

THE MEXICO.—Very good work is being done grading for the heavy new machinery and getting it into place. The new works will be ready to start up about the middle of next month, when sinking the shaft deeper will be resumed.

NORTH CONSOLIDATED VIRGINIA.—Sinking the shaft is making good headway, the rock in the bottom working quite soft. Stringers of favorable looking quartz are frequently encountered.

BEST AND BELCHER.—The double winze below the 1500-ft level is repaired to within 12 feet of the 1700-ft level. The water is being hoisted from the 1700-ft level by the tanks of the Gould & Curry shaft, and is reduced

(Continued on Page 140.)

The Origin, Manufacture and Uses of Brass.

A contemporary contains, under the above title, the following historical data concerning this useful alloy: "Brass was common in Egypt long anterior to the exodus of Israel, for during that nation's journey to Canaan, the Israelitish women contributed their brass mirrors, which they brought with them out of Egypt, when brass was needed to make the brazen laver. The fact that the Egyptians were able to burnish brass so highly as to give perfect reflection of the 'human face divine,' would indicate not only great skill, but a large experience in its manufacture and use. Five hundred years after this time, Hiram of Tyre cast two pillars of brass—Jachin and Boaz—for the portico of Solomon's temple; these were more than 35 feet high, and some five or six feet in diameter. So valuable was the brass of which these pillars were composed considered, even by the Babylonians, when the pillars were nearly 500 years old, that during the destruction of the temple by Nebuchadnezzar, his soldiers broke them up and carried the material to Babylon to increase the richness of that great city. Among both the ancients and the moderns, brass has always ranked high among the useful and the ornamental metals.

"As early as 1750, mills and machinery for rolling and slitting iron were in operation in the United States. The first of which we have any record were put up in Middleboro', Hanover, and Milton, Mass.; but not until 1802 was such machinery called into requisition to roll brass and more readily to make it useful. At that time Abel Porter & Co. started a brass hutton manufactory in Waterbury, Conn. This firm had their brass ingots partially rolled in an iron rolling mill, and then completed the process by means of small rolls, driven by horse-power, in their own mill."

The article does not describe the manufacture of brass, and as practically this is of much more importance than any curious historical recollections, we will proceed to supply the deficiency. Brass is nothing but copper, of which the softness has been diminished, the melting point lowered, and the red color more or less changed to a golden yellow by the addition of zinc. The various proportions of the two metals give, as might be expected, various qualities to the brass. The addition of very little brass, say from one to eight per cent. to the copper, does not produce much change in the latter metal, except that such an alloy can be cast, which is not the case with pure copper, of which therefore, castings are seldom made, as it cannot be cast sound. The common practice among founders is to add an ounce of ordinary brass to every pound of copper to be cast. The addition of from five to seven per cent. of zinc to copper produces the gilding metal for common jewelry, while the reddish sheet brass produced at Hegermuhl contains, according to Ure, 13 per cent. of zinc. The pinchbeck, Manheim gold, Similor, and other alloys of various names, contain from 15 to 20 per cent. of zinc, while for bearing solder well, an addition of from 25 to 30 per cent. of zinc is necessary, the so-called Bristol brass consisting of this proportion. Emerson's patent brass was made of the constant proportion of 33 1/2 per cent. of zinc, or one part of zinc to every two parts of brass, while Mun's sheathing for the bottoms of ships contains from 37 to 40 per cent. of zinc. He says in his patent specification that any alloy between 50 of zinc to 50 of copper and 37 of zinc to 63 of copper will roll and work at a red heat, but that 40 per cent. of zinc to 60 of copper is the best; 44 per cent. of zinc to 56 of copper is the so-called spelter solder, used for soldering copper and iron; but to take 50 per cent. of zinc (equal parts) is generally considered better, as during the process of melting much of the zinc is always lost, it being quite volatile.

It is well known to practical men that spelter solder is found in the trade in a granulated form. The way to produce it in this form is to pour the alloy of equal parts of zinc and copper into an ingot mold with cross ribs, which incite it into little squares of about two pounds weight. These squares are then heated over a charcoal fire to nearly a cherry-red, and then broken upon an anvil, or with an iron pestle in a mortar. The right degree of heat is a very important point, as when too hot the solder will not crumble, on account of its roughness, but is beaten into a cake or coarse lumps, and becomes tarnished; when not hot enough, it will not break up at all; by a proper heat, it becomes nicely granulated, retains a bright yellow color, and is afterwards passed through a sieve. The ultimate proportion is less than 50 per cent. of zinc, by reason of the loss referred to.

The so-called patent Mossaic gold of Parke contains from 52 to 58 per cent. of zinc, and is dark colored when first cast, but becomes of a beautiful yellow tint when dipped in acid. From 60 to 70 per cent. of zinc for 40 to 30 of copper is a blueish-white brittle alloy, very brilliant, but so crystalline that it can be pounded cold in a mortar by a pestle. Lastly, 80 or 90 per cent. of zinc to 20 or 10 per cent. of copper, is hard and crystalline, and differs little from zinc, except that it is much stronger and more tenacious.

It is evident that from the volatility of zinc a very exact definite proportion can not be well obtained in melting; the fusibility increases exactly in proportion to the amount of zinc used, but not the yellow color; the red color of copper scarcely changes by the addition of less zinc than 20 per cent. to 80 of copper; at 25 per cent.

of zinc it slides into that of yellow brass, and remains nearly unaltered until the addition of some 40 per cent. of zinc, when it becomes whiter; until the addition of 65 per cent. of zinc to 35 of copper, the alloy has the brilliant silvery color of speculum metal, while by a further increase of zinc it adopts a bluish tint.

The ductility and malleability is nearly fully retained in all proportions from the pure copper until 40 per cent. of zinc is used against 60 of copper; additional zinc causes brittleness. The very best brass for all practical purposes, and which will file and turn well, consists of 20 per cent. of zinc to 80 of copper, and 36 of zinc to 64 of copper. This range is wide, but beyond this it does not work well; with more zinc it is too hard and crystalline, with less zinc it is too brittle or greasy, and hangs to the file like copper.

We ought to add here that before zinc was known as a separate metal, brass was made by adding to the copper, during the process of its fusion, a quantity of ore.

Eberhardt & Aurora.

We are informed that Captain Frank Drake, superintendent of the Eberhardt & Aurora company, will take his departure to-morrow for London, and will be absent two or three months. During his absence the captain's brother will superintend the affairs of the company. We have known some time that he contemplated a visit to London for the purpose of consulting with his company in regard to more extensive mining operations. His company will no doubt give him a very hearty greeting for the able manner in which he has placed them on the high road to prosperity. When Mr. Dreke undertook the superintendency of their affairs he found them in a deplorable condition and the company almost in a state of bankruptcy, and with little inclination to invest any more capital. In little less than a year he rebuilt the 30-stamp mill, which had been burned to the ground, and placed a large number of men in the mines, which became very remunerative, and in nine months' time paid all the indebtedness both of his company in London and White Pine, which aggregated no very small amount. After having accomplished all this, with a limited amount of capital and in so short a time, his company should esteem him as a competent and trustworthy superintendent, which we have no doubt they will do in a very substantial manner. We have not the least hesitation in saying that Capt. Drake has more executive ability than any other mining superintendent ever employed in Hamilton. There are few men, if any, who could have accomplished under the same circumstances what he has done. We hope he will succeed in convincing his company of the necessity of running a tunnel through Treasure hill, the economy of which must be apparent to them when properly explained. During his absence a great amount of prospecting and mining will be done on the several mines of the company, so that in the spring, when hauling can be done, the mill will be started up for an uninterrupted run of the year. The mill is now undergoing general repairs, and when completed will in all respects be equal to a new one. We wish the captain a safe and pleasant visit to London and a speedy return to his old friends here.—*White Pine News*.

MEASURING BY THE EYE.—Years ago, says a correspondent of the Boston *Transcript*, when we went to school in a little weather-beaten schoolhouse, what exciting contests there used to be over the teacher's favorite exercise of having the scholars estimate with the eye the size and weight of different objects in the room! He would hold up his cane, and have each one tell how long he thought it was, and it was a lucky child that could come within half a foot of the right length. He would measure an archin and then have the scholars try to reproduce the measure on the wall. He would mark off an inch or a foot or a yard in some conspicuous place, and then see how near anybody could come to chalking the same length on the blackboard. And it was astonishing how wide astray one would go. The fact is, our eyes deceive us ridiculously even upon the commonest things. At first thought, which should you say was the taller, a three-year-old child or a flour barrel? And could anything but actual measurement convince you that the same child is half as high as a six-footer? There is an old saying that a child two years old is half as tall as he ever will be; and after a few experiments in measuring one can easily believe it, but not before.

TIMBER LANDS.—Senator Kelly's bill for the sale of timber lands in the States of California and Oregon and in the Territories of the United States, has been reported favorably by the Senate Public Lands Committee without amendment. It provides that certain surveyed public lands in California, Oregon and Washington Territory, valuable chiefly for timber but unfit for cultivation, may be sold in tracts not exceeding 160 acres to any one citizen or association, at the minimum price of \$2.50 per acre. For the other Territories the size of the tracts is limited to 40 acres. The bill is a copy of the measure recommended by the Public Lands Committee of the House of Representatives (based on Mr. Page's public land bill). It may be remembered that it contains a number of stringent requirements for oaths and affidavits to prove the character of the land, and that it is purchased for individual use and not for speculative purposes.

San Diego Mines.

A correspondent of the San Diego *World*, writing from Julian City, says:

Thinking that a few items from the mining section would be of interest to the readers of your paper, I pen the following: We are experiencing one of the heaviest storms that has visited Julian and vicinity for the past six years.

Weather, Snow, Etc.

On Thursday afternoon about four o'clock it commenced snowing. On the following day, at 12 o'clock, the snow measured 18 inches in depth. The snowfall is about three feet, but for the past 36 hours it has run off as fast as it fell. At present there are about 12 inches on the ground. This evening the weather has moderated, it growing much warmer and a light rain falling. Should it continue to rain till to-morrow, you may look for a flood about Old Town, as the snow will have melted by that time, making a fearful rise in the San Diego river.

Farming, Etc.

The farming interests in this vicinity are safe this season, as there has been sufficient rain to insure abundant crops, and one will observe a smile of satisfaction playing upon the features of the sturdy husbandman of this section.

The Mines.

The mines are progressing steadily and developing beyond the expectation of the most sanguine.

The Helvetia.

The Helvetia, one of the pioneer mines of the district, has the main shaft 300 feet deep, with levels drove, east and west from the bottom of the same respectively, 100 feet. The ledge averages three and one-half feet in width of very fine ore. With a force of 20 men this company are enabled to keep their 10-stamp mill running day and night. The amount of ore in this mine is unlimited, and under its present system of working cannot otherwise than prove remunerative to its owners. One conversant with mining, observing the condition of this mine, and the machinery employed in operating the same, will be convinced that the Count, the present superintendent, understands his business as a mining engineer.

The Tom Scott

Company have their shaft down 150 feet, and are now driving a level west on the ledge to connect with the air shaft. This level is now about 40 feet from the main shaft, showing three feet of ledge—three tons of which was crushed at the mill of the Helvetia company, a short time ago, for a test, which yielded \$35 per ton. When this company make the connection between the two shafts, which are 100 feet apart, they will have an immense body of ore above the 150-ft level to stoop out.

The Pride of the West.

Owned by Fred. Beck & Co. They are prospecting work on their mine, which gives promise of taking rank with the leading mines of this district. Seventeen tons of ore crushed from this mine, a few days past, yielded \$48 per ton.

Hidden Treasure, Big Blue.

A lot of rock was recently crushed from the Hidden Treasure and the Big Blue, the former yielding \$80, the latter \$85 per ton.

So RAPID has been the course of business between the two greatest of American cities—New York and Philadelphia—that notwithstanding the great efforts made in every way possible by the old companies, it was thought they would soon be taxed beyond their power entirely. Soon, however, the traffic will be better met, for we are told that: "The new railroad from New York to Philadelphia is nearly completed, and will soon be in operation. The length of the 'New York and Philadelphia New Line,' from Liberty street in this city to Berks street, Philadelphia, is 88 miles. The distance will be accomplished in one hour and fifty minutes."

A REMARKABLE example of rapidity in deep boring has recently been furnished by the first bore-hole put down by a company formed to search for coal in Switzerland. A depth of 1,422 feet was reached in two months, including the re-boring of the upper 640 feet from three and one-eighth inches to seven inches in diameter. The work was done, including all delays, at a rate of over 1,000 feet per month, the highest speed being nearly 77 feet in 24 hours. The results obtained were negative, the section showing about 1,200 feet of permian strata resting upon old crystalline rocks; but the trial is only the first of a series.

SPEAKING of the coal mines near Uter City, Coos county, Oregon, the *News* says: "The vast amount of coal which lies imbedded in these hills is almost incredible. The foreman and the miners say the outcrops of eight good workable veins are distinctly visible on the side of the mountain owned by Uter & Ojeda. Each one of these veins is a mine of itself, and can easily be made to produce 150 tons daily—the product of the eight veins thus aggregating a total of 1,200 tons per day."

A lot of bullion worth \$9,000 was shipped from the Virtue mine the other day, by way of Boise and Silver City, but the express agent, fearing mischief, held the bullion over one day, thus disappointing the robbers, who had evidently been informed of the proposed shipment, as they stopped the very stage on which it would have been had it not been delayed.

English vs. American Workmen.

In pursuance of instructions, United States consuls in Europe have been supplying to their government some information relating to the laboring classes, and the chief of the Bureau of Statistics has published the result of the inquiry. The general conclusion to be drawn from the answers is unfavorable to the efficiency of English labor as compared with American. It would seem that nine hours of an American's labor are equal to about ten of an Englishman's, the superiority being nearly represented by the ratio of 10 per cent. The consuls at Bradford, Sheffield and other manufacturing cities, and the chief of the bureau himself, came to this conclusion after much investigation. This is especially true of heavy manufacturing work, such as machine and engineering work and the fabrication of hardware, cutlery and other manufactures of iron and steel. In all these branches 900 Americans are thought to be equal to 1,000 Englishmen in the amount of work per week they will accomplish.

This corresponds with the experience of our own manufacturers. It has before been observed here that in labors demanding enormous physical strength and endurance—like iron puddling—the Americans were superior to the English; while in patient, steady drudgery the British "navvy" or Irish day laborer is much beyond the Yankee; and Mr. Brassey's experience is no doubt true, that the English day laborer is the cheapest laborer in the world, because he accomplishes the most for the money. The American demands a toil with some peculiar stimulus to call out his best powers. Thus, in a dangerous, difficult employment like lumbering, demanding great strength and presence of mind, no nationality is equal to the American. The superiority, however, of which we have spoken, seems to be less true in other branches, and in cotton and woolen manufacture the British superiority is expressed by the ratios of eight and six per cent.

The explanation given by the report of the greater efficiency of American labor is probably the true one—that it lies in its greater "adaptability," owing to the superior education and intelligence of the American factory workman, and in more temperate American habits. The English workman requires a day or two to get over his Saturday night and Sunday night drinking sprees. The extent to which the English laboring class drink up their wages appears in a melancholy form in this report. The consul at Sheffield reports that great numbers of working men stop work on Saturday noon, and do not commence again till the following Wednesday. This is, in part, because they need Monday and Tuesday to enable them to recover from the effects of Sunday's drinking. "Increase of pay," says the consul at Birmingham, "means increase of drink." In Manchester, our consul reports that many sober working women complained that increased wages and shortened hours of labor were a curse to the families, as the men were only more tempted to drink. In Liverpool there seems a widespread and fearful demoralization of the laboring class from their intemperate habits. And thus from almost all the manufacturing centers our officials report a wretched condition of workmen's families and reduced efficiency of labor from the habits of intemperance prevalent.

A curious fact also appears in these researches, namely, that a rise of wages does not always produce more work. Thus in the collieries of Leeds the product for each person in 1864 was 327 1/2 tons for 313 working days, or 21 1/2 cwt. for each person per diem. In 1868 it fell to 317 tons, or 20 cwt. per diem; in 1873 to 17 1/2 cwt. for each person per diem. That is a reduction of production in 10 years of 19 per cent., while wages have risen 30 per cent. and upward. In Manchester the average earnings of a certain mine were four shillings seven pence per day in 1871; in 1872 the wages had more than doubled, and yet the earnings were two pence less per week for each man. The workmen averaged less than four working days per week, while many only worked three days. The statistical proof presented by the United States Bureau of Statistics of the terrible loss and degradation to the English laboring classes produced by their drinking habits will not be one of the least of the good results accomplished by this able report.—*Iron Age*.

MACHINE SHOPS IN RUSSIA.—In 1866, Russia had 100 foundries and machine shops, only 52 of which were provided with steam. At the present time there are 362 of these establishments, 79 of which are exclusively occupied with the manufacture of agricultural implements. Statistics are to hand concerning 179 shops only; these employ 46,528 workmen. In 1868 there were 222 locomotives made in Russia; last year the number was 768. A large number of English workmen are employed in Russian engineer shops, but they complain of being treated as naturalized Russian subjects—that is to say, their personal rights and liberties are but little respected.

The bullion product of the Boston and Colorado smelting company, at Black Hawk, Colorado, has been \$28,500 in silver for the past week, the gold ore being shipped to Boston. The letter part of this month the mill will commence the treatment of gold ores, and will continue transactions in that line during the year. Professor Hill, the manager, anticipates that the product of the works for the year will amount to \$3,000,000.

USEFUL INFORMATION.

Hints on Familiar Things.

Why is a ray of light composed of various colors? As every ray of light is composed of all the colors of a rainbow, some things reflect one of these colors, and some another.

Why are some things of one color, and some of another? As every ray of light is composed of all the colors of a rainbow, some things reflect one of these colors, and some another.

Why do some things reflect one color, and some another? Because the surface of things is so differently constructed, both physically and chemically.

Why is a rose red? Because the surface of a rose absorbs the blue and yellow rays of light, and reflects only the red ones.

Why is a violet blue? Because the violet absorbs the red and yellow rays of the sun, and reflects the blue only.

Why is a primrose yellow? Because the surface of the primrose absorbs the blue and red rays of solar light, and then reflects the yellow ones.

Why are some things black? Because they absorb all the rays of light, and reflect none.

Why are some things white? Because they absorb none of the rays of light, but reflect them all.

Why are the leaves of plants green? Because a peculiar chemical principle, called chlorophyll (signifying green leaf), is formed within their cells; which has the property of absorbing the red rays, and of reflecting the blue and yellow, which (being mixed together) produces green.

Why are some things transparent? Because every part between the two surfaces has a uniform refracting power, or (in other words) has in every place the same density, and, therefore, the rays of light emerge on the opposite side.

Why are some things not transparent? Because the particles which compose them are separated by minute pores or spaces, which have a different density from the particles themselves. Therefore, the rays of light are too often reflected and refracted to emerge.

A SIMPLE WAY OF PROCURING FRESH WATER FROM SEA WATER.—A method of procuring fresh water from sea water through the direct action of the sun's rays is among the foreign inventions. The apparatus consists of a box of wood one inch thick, about 14 feet long, two feet wide, and an average depth of six inches. The upper part of the box is closed with ordinary glass, which has an inclination of an inch and a half. At the lower edge of the glass there is a semi-circular channel, destined to receive the fresh water which is condensed on the interior surface of the glass. The operation is entirely simple. The salt water is let into the box for about an inch in depth, and then it is exposed to the rays of the sun. A very active evaporation then begins, and it is found that a square meter of glass will condense daily the amount of two gallons of pure water.

PRESERVING WOOD BY THE APPLICATION OF LIME.—The method of preserving wood by the application of lime, as pursued by M. Stovall, is published in the French journals. He piles the planks in a tank, and puts over all a layer of quicklime, which is gradually slacked with water. Timber for mines require about a week to be thoroughly impregnated, and other wood more or less time according to its thickness. The material acquires remarkable consistence and hardness on being subjected to this simple process, and, it is alleged, will never rot. Beech wood has been prepared in this way for hammers and other tools for iron works, and it is said to become as hard as oak without parting with any of its well-known elasticity or toughness, and to last much longer than when not thus prepared.

BAO MARKING INK.—A correspondent of the *English Mechanic* gives the following recipe for an ink, the permanency of which he says is perfect, even when bags filled with chemical manures have been in rain and sunshine for ten days: Boil one pound of logwood chips in one gallon of water, at boiling point, ten minutes; then stir in the eighth of an ounce of bichromate of potash, and boil this 10 minutes longer; then add, when cold, one-half pound of common gum, dissolved, and stir well in. This will flow well from the pen, and will mark bags with either the stencil plate or block. The cost of the above ink is about 12 cents per gallon.

The first houses with glass windows mentioned in history, were erected in the ancient city of Tyre, in Syria. The first plate glass made in England for looking-glasses, coach windows, etc., was made at Lambeth, in the year 1673.

AN OAKEN COLORED can be given to pine tables by washing them in a solution of copperas dissolved in strong lye, a pound of the former to a gallon of the latter. When dry, this should be oiled, and it will look well for a year or two; then renew the oiling.

AFTER filing a saw, place it on a level board and pass a whetstone over the side of the teeth until all the wire edge is off them. This will make the saw cut true and smooth, and will remain sharp longer. The saw must be set true with a saw set.—*Scientific American*.

ANOTHER NEW ELECTRIC BATTERY.—This apparatus, invented by two Frenchmen, is contained in a square glass jar. The pile is composed of a prism of charcoal which contains sesquioxide of iron in its pores, and a small rod of amalgamated zinc. The latter passes through the stopper, to the nuder surface of which is fixed the charcoal. A solution of ammonium chloride is used as the exciting fluid. The reactions are the same as in Leclanche's couple, in which oxide of manganese is used. When the circuit is closed, the chloride of ammonium attacks the zinc, forming a double chloride of zinc and ammonium. The latter, on being set at liberty, decomposes the sesquioxide of iron, carrying off a part of its oxygen and forming free ammonia, which disappears by evaporation. This pile ceases to act so long as the circuit remains open. Its durability and force are large. Its electromotive power is as 12 to 10 of the sulphate of copper battery, and it is thus well adapted for industrial purposes.

MEASURES FOR MEN.—One thousand shingles laid four inches to the weather will cover one hundred square feet of surface, and five pounds of shingle nails will fasten them on. One-fifth more siding and flooring is needed than the number of square feet of surface to be covered, because of the lap in the siding and the matching of the floor. One thousand lath will cover seventy yards of surface, and eleven pounds of lath nails will nail them on. Eight bushels of good lime, sixteen bushels of sand and one bushel of hair, will make enough good mortar to plaster one hundred square yards. A cord of stone, three bushels of lime and a cubic yard of sand, will lay one hundred cubic feet of wall. Five courses of brick will lay one foot in height on a chimney; six bricks in a course will make a flue four inches wide and twelve inches long; and eight bricks in a course will make a flue eight inches wide and sixteen inches long.

CHANE chains should once in a while be taken off and thrown into a furnace until red hot, then brought out and be kept in a compact pile and permitted to cool slowly. Better still, let them remain in a furnace after coming to a heat and then to cool off with the furnace. Where a furnace can not be had for the purpose, they can be heated in a large wood fire and then be permitted to cool as slowly as the fire was dying. Being thus annealed they are safe.—*Am. Manufacturer*.

GOOD HEALTH.

Bicarbonate of Soda a Toothache Remedy.

Dr. Buckworth, of St. Bartholomew's hospital, London, has recently successfully used bicarbonate of soda as a remedy for severe toothache, when applications of chloroform, either externally to the cheek or to the ear, or placed on cotton in the decayed tooth, failed; and when carbolic acid, applied as last mentioned, also proved inoperative. Pledgets of cotton soaked in a solution of 30 grains of bicarbonate of soda in one fluid ounce of water gave almost instant relief. Dr. Buckworth considers that very frequently the pain is due to the contact of acid saliva with the decayed tooth, and therefore it is important, in cases of odontalgia, first to determine whether the saliva has an acid reaction. If this be the case, then a simple alkaline application, as above stated, is the most efficacious means of cure.

Cases of toothache are so common accompaniments to disordered stomach that there seems every reason for the truth of the above author's conjecture. Doubtless on the same ground is due the efficacy of ammonia, so frequently recommended, but which, if applied carelessly, is liable to produce more pain by burning the gum than already exists in the tooth.

Bicarbonate of soda is found in every kitchen, and hence no more handy remedy could be devised, while it is destitute of any painful effects; and the rationale of its operation and its simplicity make us wonder why it has not been thought of before.

KILLED BY A MOUSE.—A extraordinary occurrence was brought to light at an inquest held a few days since on the body of a man in South London. It appears that in a work room where many young girls were at work, a mouse suddenly made its appearance on the table, causing, of course, considerable commotion and a general stampede. The intruder was seized, however, by a young man who happened to be present, but the mouse slipped out of his hand, and running up his sleeve, came out between his waistcoat and shirt at the neck. The unfortunate man had his mouth open, and the mouse, on looking for some place of concealment, entered the man's mouth, and he, in his fright and surprise, swallowed it. That a mouse can exist for a considerable time without much air has long been a popular belief, and was, unfortunately, proved to be a fact in the present instance, for the mouse began to tear and bite inside the man's throat and chest, and the result was that the unfortunate fellow died, after a little time, in horrible agony. Several witnesses have corroborated the above facts, and medical testimony as to the cause of death having been given, a verdict of accidental death was returned.

Some Causes of Nervousness.

Imperfect and insufficient sleep is one of the most frequent causes of nervousness. In Realmah, that strange country which Sir Arthur Helps so quaintly describes, "tired nature's sweet restorer" could be bought in three grades of different prices, the costliest one being of a pale blue color. Partaking of this, the happy buyer sank into a profound and dreamless sleep, while the cheaper kinds procured only the lighter forms of rest, haunted by dreams and disturbed by thick-woven fancies. Next to air sleep is the greatest need of man. "Who sleeps eats," says the ancient proverb. Food and drink may be diminished without fatal results, but want of sleep is followed by insanity and death. Those who suffer from nervousness on account of inane sleep should lose no time in correcting the evil. Everything calculated to excite the brain or disturb the nerves for two or three hours before bedtime, such as stimulating beverages, hearty food, exciting conversation or literature, should be rigidly avoided. It is said that half a dozen small onions eaten just before retiring will act as a harmless anodyne, and induce profound and refreshing sleep.

Another fruitful cause of nervousness is bad air. Many a child grows pale and sickly from attendance, as is supposed, at school, and the parents think the child is studying too hard. In a large majority of such cases the evil results are the consequences of the impure air the child breathes, and would not follow twice as severe mental application in a room thoroughly and constantly ventilated. Doubtless a large part of the teachers who "break down" in teaching do so because of the bad air they breathe from day to day. Many a housekeeper would escape attacks of nervousness if she kept the windows up and the doors open, and let the sunlight pour into her rooms with healing in its beams.

Another cause of nervousness is indulgence in strong tea and coffee. The person who depends on his coffee as the main article of breakfast will be sure to eat less nutritious food at that meal than if his beverage were cold water; the nerves, only stimulated, but not fed, will by and by mutiny. The strength which comes from stimulating drinks of all kinds is fictitious, not real; it is a draft on the future that will be some time he presented for payment to an empty exchequer. *Delirium tremens* is nothing more than the cry of the wronged and cheated nerves for food.

Overwork often produces nervousness, and the cure is rest. Many people think they must go on killing themselves by slow degrees in this way, and when they have succeeded, lookers-on are no wiser than before, but keep on taxing themselves beyond their strength and paying the penalty. Of all the causes of nervousness the most prolific is worry. If, having done our best, we could only leave the consequences to the Higher Powers; if we could but be content to take life as it is and make the most of it; to do the duty of the hour promptly and with fidelity and think no more about it; to open our hearts to all the gentle influences of nature that woo us, and enjoy without murmur or question the good and the evil that fall to our lots, confident that they are alike beneficial, to live aright in the present and leave the future to God, what a world of trouble and anxiety we would be saved! Plenty of sleep, plenty of air, plenty of food, and an abounding trust in the goodness of God will keep those who enjoy these blessings from the tortures of nervousness.—*N. Y. Tribune*.

An Arsenic-Proof Stomach.

A thirteen-year-old daughter of a Mr. Flagg, residing near Whitehall, is exciting the attention of the physicians, and scientific men in that vicinity. Some time ago Flagg put some arsenic on some bread and placed it in a portion of the house frequented by rats. The bread suddenly disappeared, and again and again other pieces were placed in the same locality, with the same result. He finally determined to watch and ascertain, if possible, what became of it. He had not long to wait before he was horror-stricken to observe his little daughter walk away from the place, cramming her mouth with the poisoned bread. A physician was sent for, and before his arrival the sobbing child made known to her parents that she had eaten all the bread that had been prepared for the rats, and that she liked it better than anything she had ever tasted. The physician was surprised, and thinking, possibly, that the drug might not be arsenic, he examined it, and found it arsenic beyond a doubt. To still further test it he tried a small quantity of it on a cat, which quickly sent the animal into convulsions, causing its death very soon afterwards. What seems remarkable, too, is the fact that ever since the child first tasted arsenic it has begged for the deadly drug, time and time again. About a year ago the girl fell sick with fits. Nothing would bring her out of the convulsions. In her quiet moments she would beg incessantly for arsenic. The physician in attendance, believing that the girl could not possibly recover, ventured to give it to her. The child devoured it with avidity, and in less than three days she was as well as usual. Since then she has taken the deadly poison at different times, the only effect it having upon her being to make her appear well, bright and cheerful. The case has been laid before several scientific men, all of whom pronounce it one of the most remarkable phenomena of the age.—*N. Y. Times*.

DOMESTIC ECONOMY.

How to Wash Dishes.

Faith Rochester writes in the *American Agriculturist*: I dislike greatly to wipe dishes that have not been drained from clear hot water. Yet I seldom see any one wash and wipe dishes in my way. Usually the dishes are washed in suds, and then are either passed immediately through hot water and wiped by an assistant, or they are piled up and afterward are turned over in a dish-pan as though to drain them (over their backs), after which each is taken from the rinsing water and immediately wiped without previous draining. In either case the wiping cloth is made quite wet, and sometimes two or three are needed for the operation. I think it is a saving of labor, on the whole, to drain the dishes, though one has to use a common dish-pan for it, as I do. There is no other comfortable process if children do the work. A little girl, six years old, washes and wipes all of my breakfast dishes, and usually wipes the dinner dishes for me. She kneels in a chair at the dish-table and does her work very satisfactorily. I first wash the pans and stone or iron dishes, all of the big, awkward, or very sticky utensils, and my rinsing water serves as her dish water. I get the work all ready for her, placing the plates in the bottom of the dish-pan, with saucers, cups, etc., at the top, and knives, forks, and spoons stuck in around the sides. When I call her to the work, she finds these dishes soaking in warm water, with a clean, orderly table to pile them upon as she washes them. Sometimes I get the rinsing water for her from the stove reservoir, but if I am busy she gets it herself, if able to empty the big dish-pan of the dish water. The big pan is used for draining the dishes, after being wiped out clean with the dish-cloth. The rinsing water is in another pan, and the washed dishes are run through it, cups first, then bowls, saucers, plates, etc., and are all turned down to drain in the dish-pan. They dry very fast, and the wiping cloth is scarcely damp when the work is done. Some good housekeepers wipe the dishes directly from the first suds, but that never seems to me a clean way of doing.

"I always scald my dishes," boasts one, but I happen to know that her dishes are usually streaked or sticky when put upon the shelves, because she "scalds" them in such an absurd manner, turning them all down in her pan, and pouring hot water over the backs of her dishes, leaving the faces of the plates and other dishes unclean, while the heating they get from the hot water on their backs dries the suds or greasy dish water in streaks, which do not all wipe off; and so the wiping-towels get quickly soiled.

A Royal Dish.

I lately saw a picture and a description of a dish said to be greatly relished by Emperor Dom Pedro, from whom it derived its name. Now, I had no such pan or dish, but I was determined to contrive one. Therefore, I went to the kitchen press, took down the steamer—its bottom is loose, and can be taken out—took out the bottom and found that it would just fit the top of our smallest frying-pan or spider. Next day I contrived to have 100 many potatoes for dinner; these I placed on the steamer-bottom, making a smooth pyramidal shape of them, placed a bit of butter upon them, then put the gravy and meat scraps left from dinner in the spider, added a little water, and put the potatoes and steamer-bottom upon this and placed all in the oven of the cook stove. At supper my makeshift dish was heartily partaken of and praised, and I presume was as good as if I had possessed the real "Dom Pedro dish" to cook it in. The potatoes were baked a nice brown, the meat and gravy warmed over nicely, and the steam from the meat had gone into the potatoes, making them better than if baked in a pan.—*Carrie Lee, in Am. Patron*.

To prevent flat irons from rusting, melt one-fourth ounce of camphor and one-half pound of fresh hog's lard over a slow fire, take off the scum, and mix as much black lead with the composition as will bring it to the color of iron. Spread this over the articles for which it is intended. Let it lie for 24 hours, and then rub it well with a dry linen cloth. Or smear the irons over with melted suet, and dust thereon some pounded unslaked lime from a muslin bag. Cover the irons with baize in a dry place when not in use.

GINOEN CAKES.—Rub a quarter of a pound of butter into half a pound of flour, mix one egg, three ounces of powdered loaf sugar, and half an ounce of ground ginger with the butter and flour, and make them altogether into a paste; roll it out a quarter of an inch thick and cut it into round cakes, about two or three inches across; bake them in a warm oven, on iron plates.

A GOOD GRAVY.—Chop fine some lean meat, an onion, some slices of carrot and turnip, and a little toyme and parsley; put these with half an ounce of butter into a saucepan, and keep them stirred until they are slightly browned; add a little spice, and water in the proportion of a pint to one pound of meat. Clear the gravy from scum, let it boil half an hour, and then strain it for use.

MINING SCIENTIFIC PRESS

W. B. EWER.....SENIOR EDITOR.

DEWEY & CO., Publishers.
A. T. DEWEY, GEO. H. STONG,
W. B. EWER, JNO. L. BOONE

Office, No. 224 Sansome St., S. E. Corner
of California St., San Francisco.

Subscription and Advertising Rates:
ADVERTISING RATES.—1 week, 1 month, 3 months, 1 year.
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in solid type, giving in our columns one-third more
reading than is contained in ordinary leaded matter.

San Francisco:

Saturday Morning, Feb 26, 1876.

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THE MINIMOTOR.—This is the name of a new
motor which is now being introduced in this
city by Huntington, Hopkins & Co., one of the
machines being in operation at their store on
Market street. This little motor is intended
as a safe and economical power for very light
work, such as running sewing machines, dental
engines, coffee and spice mills, fans for refrig-
erators and engines, small lathes, etc. The
minimotor uses compressed air for motive
power. It is made quite small, so as to be run
by the heat of gas. The one at Huntington &
Hopkins is a one-horse engine, and coal is used
for heating purposes. There is no boiler to
explode, as there is no steam, and the whole
thing is quite simple. We shall shortly give a
detailed description of this machine, with en-
gravings.

The excitement in Heidelberg over the dis-
covery near that place of rich gold and silver-
bearing rock is unabated. Assays are said to
run between \$900 and \$1,000 gold and silver
to the ton.

It is stated that a new vein of coal, 11 feet
thick, has been discovered on the Skagit river,
Washington Territory, by Messrs. Tracy and
Stevens, and is considered of a superior quality.

More sulphur discoveries are being made to
the westward of Steamboat Springs. They
have now found a very rich deposit that is
traceable for over a mile.

WILLIAM ROBERT DUKE, one of the survivors
of the "Light Brigade," which made the
famous charge at Balaklava, is in this city.

Production of Quicksilver at New Almaden for 23 Years and Three Months.

DATES.	CLASS AND QUANTITY OF ORE.			Total Pounds.	Flasks from Furnaces.	Flasks from Washings.	Flasks Total.	Average Per Month.	Per Cent. of Total.	No. of Months.
	Griso, Pounds.	Granza, Pounds.	Tierras, Pounds.							
July 1850 to June 1851.				4,970,717	23,876		23,876	1,899.39	36.74	12
July 1851 to June 1852.				4,643,230	19,921		19,921	1,660.08	32.82	12
July 1852 to June 1853.				4,839,520	18,035		18,035	1,503.75	28.50	12
July 1853 to June 1854.				7,448,000	26,325		26,325	2,193.37	27.03	12
July 1854 to June 1855.				9,109,300	31,860		31,860	2,655.00	26.75	12
July 1855 to June 1856.				10,355,200	28,083		28,083	2,340.25	20.74	12
July 1856 to June 1857.				10,299,900	26,002		26,002	2,167.17	19.31	12
July 1857 to June 1858.				10,997,170	29,347		29,347	2,447.25	20.41	12
July 1858 to Oct. 1858.				3,873,085	10,583		10,583	2,447.25	20.91	4
Nov. 1858 to Jan. 1861.	Closed	by Injunction.								
Feb. 1861 to Jan. 1862.				13,393,200	32,402	3,363	34,765	2,897.17	19.96	13
Feb. 1862 to Jan. 1863.				15,281,400	39,262	1,129	40,391	3,366.86	20.22	12
Feb. 1863 to Aug. 1863.				7,172,660	17,316	2,243	19,564	2,795.00	20.86	7
Sep. 1863 to Oct. 1863.				2,346,000	4,820	700	5,520	2,760.00	18.00	16
Nov. 1863 to Dec. 1863.				54,800	1,586,500		2,359,300	4,040.47	4,447.22	18.65
Jan. 1864 to Dec. 1864.				1,259,400	18,730,300		23,277,600	42,176.33	42,489.34	13.96
Jan. 1865 to Dec. 1865.				2,283,900	25,749,000		31,943,400	47,078.11	47,194.93	11.30
Jan. 1866 to Dec. 1866.				1,506,000	19,339,100		20,845,100	34,726.25	35,150.22	10.03
Jan. 1867 to Dec. 1867.				731,500	15,639,283		16,370,783	35,999.47	24,461.03	7.19
Jan. 1868 to Dec. 1868.				2,274,203	14,566,600		25,405,653	25,577.61	25,628.23	6.66
Jan. 1869 to Dec. 1869.				150,000	11,942,175		25,458,175	16,898.14	16,898.14	5.07
Jan. 1870 to Dec. 1870.				30,000	12,631,900		21,097,700	14,423.10	14,423.10	5.29
Jan. 1871 to Dec. 1871.					13,651,700		22,034,700	18,563.50	18,563.50	4.42
Jan. 1872 to Dec. 1872.				142,000	12,777,000		21,416,600	18,391.17	18,674.54	6.62
Jan. 1873 to Dec. 1873.					8,492,375		17,330,375	11,042.11	11,042.11	7.86
Jan. 1874 to Dec. 1874.					11,294,000		23,454,000	8,867.27	8,867.27	4.29
Jan. 1875 to Dec. 1875.					12,236,000		31,106,200	15,544.10	15,544.10	6.94
Totals and Averages..	8,436,808	179,195,939	114,165,067	406,457,255	537,148	734	695,832	21,354.11	11,211.99	14.58

Product of Enriqueta from 1860 to 1863.....10,571
Total product of all the Mines on the Company's Property.....606,453 flasks, of 76 1/2 lbs. each, or 46,393,654 1/2 lbs.

A Quicksilver Furnace for Fine Ore.

We examined recently a model of a new
style of quicksilver furnace, designed particu-
larly for roasting fine ore, but in which coarse
ore can be reduced as well. It is the invention
of Daniel Jones and Daniel Jones, Jr., of this
city. It is essentially a system of vertical in-
stead of horizontal retorting, which is accom-
plished in quite a simple manner. The in-
ventors are practical men and mechanics, hav-
ing constructed a number of quicksilver furna-
ces of different patterns. They have made note
of what seemed to them objections and diffi-
culties in other furnaces, which they have en-
deavored to overcome in a furnace of their own
design.

The furnace may be considered as a series of
retorts, as no flame comes in contact with the
ore. There are only three walls to construct, as
the smut chamber makes the fourth side. The
furnace is made of fire proof material, what
iron work there is being on the outside or cov-
ered in. On top of the furnace is a place cap-
able of drying from five to six tons of ore. An
elevator carries the ore up to the hopper on
top of the furnace, where it is fed in. On the
inside of the furnace are a series of inverted
V-shaped chambers or retorts, which are heated
by the fire. The fire is fed at the bottom and
the heat, flame and gases pass up around these
chambers, and as they are hollow, pass through
them too; but the flame in no place touches
the ore.

When the ore is dropped into the hopper it
falls on to the hot inverted V shaped chamber
and then into a hot V shaped receptacle. In
the bottom of this is a slide which draws out at
certain intervals and drops the ore into an-
other similar chamber, from which it in turn
drops into another, and so on until it reaches
the bottom. For a 20-ton furnace, which is
from 15 to 20 feet high, a double furnace would
have 10 of these chambers in each side. An
eccentric rod on the outside operates the slides
which allow the ore to drop from one chamber
to the other. This rod turns very slowly, and
it will take a charge of ore about 40 minutes to
drop to the bottom. Of course, as soon as the
ore drops out of the upper retort, another
charge is admitted. Each charge is about 100
pounds, so that there would be one ton at a
time in the furnace, and for each revolution of
the eccentric 100 pounds of ore would be
charged and dropped out.

In the sides of the furnace are air holes, or
holes to see the operation as the ore passes
down. If necessary fire can be put on the
inside of the V shaped chamber from these holes.
They also afford an opportunity to clean out
the chambers without taking out any brick
work. The eccentric rods are placed on both
sides. In a double furnace, as in this case,
there would be 10 chambers on each side, or 20
drops in all.

A stream of heated air is forced into the fur-
nace and into the ore so as to assist in the de-
struction of the sulphur and give more heat.
There is no place for the ore to catch and stop,
but as it falls on the heated surfaces, which are
all inclined, it slides on to another and so on
down, being slightly retarded by the slides;
which, however, allow it to drop to the lower
chamber at regular intervals.

The retorts are entirely closed from the
flames and gases, but are thoroughly heated,
nevertheless. The furnace is accessible at any
time without tearing down anything. Any par-
ticular chamber can be removed if broken and
another one replaced. The chambers are made
in sections, and expansion and contraction are
taken into account. All the iron is covered
with a material like enamel, which is fire-proof
and not affected by the sulphurous fumes. The
smut chamber is made in sections and in
case anything is wrong it can easily be examined
without pulling down any brick work. As no
flames get at the ore the formation of much
"smut" is prevented. In the bottom of the

smut chamber is a pipe, so in case any quick-
silver should collect, it can be drawn off. The
fumes pass into this smut chamber and then
into the condenser, any style of which can be
used. Messrs. Jones have, however, con-
sidered of their own design, which they con-
sider more effective than those now in use. An
engine runs the eccentrics which operate the
slides in the bottom of each separate retort.

The furnace, as before stated, is mainly for
fine ore and dispenses entirely with the neces-
sity of working adobe. A double furnace
with condensers, engine and all complete,
with a capacity of 10 tons, will cost about \$7,000,
ready to be put in motion. There are a num-
ber of advantages possessed by this furnace,
but it must be seen to be appreciated. The
construction is very peculiar and is difficult to
describe without the use of engravings. It is
worthy the attention of quicksilver miners,
who should examine the model themselves in
order to understand it thoroughly. The model
can be seen at room 80, Nevada block.

Foundry Notes.

After several months of comparative inactiv-
ity the foundries of the city are again engaged
in work on several large contracts. These con-
sist principally of mining machinery for the
Comstock mines, which seems to be needed
heavier and heavier from year to year. The
hoisting and pumping appliances for these
mines require great mechanical skill in their
manufacture, but our foundrymen have all the
requisite tools and ingenuity to carry out any-
thing of the kind proposed.

There was cast at the Union iron works last
week the largest cylinder ever made on this
coast. The cylinder is a portion of an engine
which is being made by Prescott, Scott & Co.
for the joint shaft of the Chollar, Hsle & Nor-
cross and Savage mines. It is a compound
pumping engine of 2,000 horse-power, with
Devy's differential valve motion. The weight
of the low pressure cylinder is 20 tons, and
that of the high pressure cylinder 10 tons. The
engine is designed to work double or single
acting. It is intended to be of sufficient capac-
ity to work 4,000 feet. The total weight of all
this machinery is 700 tons, and it is much
more powerful than any pumping machinery
now on this coast.

At the Pacific iron works they are now en-
gaged in making the mold for casting a cylin-
der but little smaller than the one above men-
tioned, to accompany some very heavy mining
machinery, of which we shall shortly give a
detailed description.

At the Risdon iron works they are now at
work on a very fine pumping engine for the
Belcher and Crown Point mines, to be placed
in the Belcher air shaft. This is to be a very
handsome piece of machinery, and when com-
pleted we will describe it in detail. It is a ver-
tical compound engine of 600 horse-power,
with one cylinder of 30-inch diameter, with a
10 foot 7-inch stroke; the other diameter of 62
inches and 8-foot stroke. The valve motion
will be controlled by Patten's improvement on
Devy's valve gear. By this important im-
provement, already tested on the 400 horse-
power engine at the C. & C. shaft, and on the
Ledy Washington machinery, a small engine is
used to run and control a very much larger
one, so that the large engine can be made to
perform a stroke in five minutes, or any num-
ber up to 12 strokes per minute, the engine
making the strokes in the same length of time
whether it be running fast or slow. The cost
of the new engine will be about \$400,000.

NEW ALMADEN.—Through the courtesy of
Mr. J. B. Randol, manager, we are able to
give our readers a tabulated statement, show-
ing the details of production of the New Al-
maden quicksilver mine for 23 years and three
months. As this is the most productive quick-
silver mine in the United States, these carefully
kept details are very interesting.

Improved Joint for Hydraulic Nozzles.

John J. Crawford, of this city, has recently
patented, through the agency connected with
this office, an improvement for connecting
nozzles to hydraulic mining pipes. The object
of the improvement is to so construct and com-
bine a ball and socket joint (with the water
pipe and nozzle) that will move easily under
pressure, be free from leakage, and present no
obstruction to the passing stream, especially
when the nozzle is deflected. It also embraces
an improved balancing device for sustaining
the nozzle at whatever elevation it may be
directed.

Upon the piece of timber or block upon which
the joint is supported is secured a casting which
has two standards, extending upward, one on
each side of the casting. The rear end of the
nozzle can either be formed into a socket or
the socket may be made independently or at-
tached to it. Between the two upright stand-
ards is mounted a ring by means of pivots or
journals, so the ring can turn freely about a
horizontal axis. Inside of this ring is placed
the socket, secured to it by pivots or journals
above and below, so that it will turn freely
about a vertical axis inside of the ring. The
socket and ring thus form a universal joint
or gimbals, which will permit the nozzle to be
turned in any direction inside of a circle.

On the castings, in the rear of the standards,
and directly in line with the nozzle, is a ledge,
upon which is secured a short section of pipe,
the forward end of which is formed into a ball
or spherical head. This pipe is provided with
a bed plate and is secured in the ledge in a way
so it can be adjusted. Around the outside of
the spherical head is placed a soft metal or ex-
pansion packing ring. When the ball is firmly
compressed inside of the socket this ring makes
a tight joint. The ball is kept in its proper
relation to the socket by means of bolts. A
leather packing can also be supplied around
the inner edge of the ball, so as to force against
the inside face of the socket by the internal
pressure of water. The gimbal suspension of
the nozzle and socket will permit their being
shifted to any desired angle inside of a semi-
circle without altering the relation of the ball
or socket and at the same time preserving their
water tight connection.

It will thus be seen that the inventor provides
a joint which is held together and made water
tight solely by external means, thus avoiding
the usual obstructions to the passage of the
stream which are produced when the joint is
held together by bolts or other external devices.

In order to balance the nozzle a shaft is
mounted across the upper ends of the standards
above the joint, so that it will turn freely in
the standards, and on this shaft is secured a drum.
A chain or rope has one end secured to the
nozzle at a suitable point between the joint and
its extreme end. This chain extends back and
passes once or twice around the drum and then
has its opposite end fastened to the drum. A
lever, which extends backward to the desired
length, has its forward end fixed to the end of
the shaft, and a counter weight is arranged to
be suspended from the lever. This weight can
be adjusted to any desired point along the
lever in order to properly balance the weight
of the pipe. This arrangement will preserve a
uniform balance, no difference what position
the nozzle may be moved to, and is therefore a
great improvement on the old lever and weight
balance, whose leverage varied by its being
drawn across its fulcrum according to the eleva-
tion of the pipe.

When this balancing attachment is not used,
the upright standards can be done away with,
and the ring supported on the outer extremities
of two adjustable arms which extend forward,
thus virtually uniting the pipe and nozzle by
strong and firm connection which serves to
preserve their relative positions with each
other. By this construction and application of
the ball and socket joint much of the trouble
heretofore encountered is avoided, and besides,
the inventor does not impair the force and
equality of the stream by a tortuous course or
internal obstructions. It will be noticed that
he provides a gradually decreasing area of
water passage from the inlet of the pipe to the
discharge end of the nozzle, thus preserving
the full effect of the stream.

THE shaft of the Utah mine, on the Comstock,
has been cleaned out to the bottom, and the
tubs, cables, sheaves and other debris of the
burnt hoisting works extracted. The shaft is
sunk to a depth of 584 feet. Sinking has not
yet been resumed owing to a fearful shower
of water that sprang from cracks in the rock on
every side of the shaft with such force that it
is impossible for men to work in it while it
lasts. The pump keeps down the flow of water
with ease, and in a very few days this flow will
be drained sufficiently to permit of a resump-
tion of the sinking.

HEAT ON THE COMSTOCK.—Owing to the in-
tense heat in the main east drift on the 1700-ft
level, arrangements have been made with the
Belcher company to allow the Crown Point to
tap the Belcher air shaft on the 1500-ft level,
and conduct a portion of the fresh air in pipes
down to the 1700-ft level, which will greatly
facilitate the work in that portion of the mine.

Gems and Precious Stones.

[Written for the Press by HENRY G. HANKS.]

There have been many works written, devoted exclusively to descriptions of gems and precious stones.

Pliny, who lived between the years 23 and 79 after the Christian era, was the author of a voluminous work on natural history, translations of which may be found in book stores even in San Francisco. The thirty-seventh and last volume of this great work is devoted to mineralogy and gems. Pliny is the first known author who has written on this subject, but as the ancients know nothing of mineralogy as we understand the sciences, the reader is often at a loss to know what gem he alludes to in his descriptions. He classified gems according to color. In his catalogue he enumerates 135 distinct species.

The art of imitating gems in his day was carried to such perfection that he complains of the extreme difficulty of distinguishing between the false and true. The sardonyx was imitated by cementing three gems of different colors together and cutting them down on the lapidary's wheel. They had a trick also of cementing a plate of rock crystal to a piece of colored glass in such a manner that the surface had the hardness and luster of the crystal and the color of the glass. This imitation stone was then set in such a manner as to hide the edges. They were so skilled in the manufacture and working of glass that they could imitate all the stones and even all the marbles then known.

There were several other ancient authors who wrote of gems, and in our day there are standard works on the subject; some treating of gems *per se*, others containing page upon page of poetical allusions to precious stones without giving the reader much practical information on the subject.

The ancients had strange ideas regarding gems. They believed certain stones had the property of curing diseases, and they were carried about the person, by those who could afford it, to hold certain diseases in check, believing, with the moderns, that "prevention is better than cure."

Quartz crystals were supposed to be water hardened to adamant by long exposure to excessive cold. This belief was strengthened by observing what is not uncommon in crystals of quartz—the presence of drops of water within the crystal walls.

Pliny says: "Rain water and pure snow are absolutely necessary to pure rock crystal." The largest crystal he has ever seen weighed 150 pounds. Blocks of this mineral are found in Switzerland weighing 800 pounds. Very fine specimens are found in California, near Placerville, El Dorado county.

Pliny mentions a fable, common in his day, that the first use of precious stones originated with Prometheus, who was ordered by Jupiter to set a fragment of the rock of Caucasus in a link of his chain, and to wear it as a finger ring as an extension of his punishment after his release.

Gems can only be determined by their physical properties. It is an easy matter for the chemist to analyze any gem if he be allowed first to reduce it to a powder; but as gems are generally found singly, and as the stone, no matter how precious, must be destroyed or injured before an analysis is possible, mineralogists have devised a systematic series of experiments which lead with certainty to the determination of all gems and precious stones. In the description of the individual gems in this paper, the chemical properties are also given, for no description of a mineral substance would be complete without this; but any prospector who finds a stone which he has reason to suspect is precious, should treat it as if it was known to be such. When the rules are known, it will not be found difficult to determine gems, but to do so successfully will require some skill and the exercise of considerable judgment.

In distinguishing gems and precious stones regard must be had to the following properties of minerals: 1, Crystalline form; 2, Hardness; 3, Luster; 4, Diaphaneity; 5, Specific gravity; 6, Electricity; 7, Magnetism; 8, Optical properties; 9, Iridescence; 10, Color; 11, Phosphorescence; 12, Touch; 13, Smell.

(1.) Crystalline form. This constitutes a science by itself, and requires a thorough knowledge of the higher branches of mathematics, beyond the capacity of the ordinary reader.

Although the multitudes of modifications of crystals are so perplexing to the ordinary observer, yet they are all based on certain simple forms, as follows:

(A.) Cube and octahedron—axes 3; rectangular and equal.

(B.) Right prism with square base—axes 3; rectangular, 2 equal.

(C.) Right prism with rectangular or rhombic base. Axes 3, rectangular and unequal.

(D.) Right rhomboidal and oblique rhombic prisms. Axes 3, unequal; 2 rectangular.

(E.) Oblique dysymmetric rhomboidal prism. Axes 3, unequal and unequally inclined.

(F.) Rhombohedron and hexagonal prism.

Axes 4; 3 equal and equally inclined; 1 at right angles with the other 3.

Even this will not be easy to understand without a set of crystal models. Nor is it imperative that it should be understood, as gems are generally known by other properties.

(2.) Hardness of minerals is their power to resist any attempts to separate the atoms of which they are composed. The term hardness is comparative; a series of minerals has been selected, commencing with talc and ending with the diamond, and has by common consent been taken as a "scale of hardness," and by this scale all other minerals are compared. The following is the list: 1, (the softest) talc; 2, uncrystallized gypsum; 3, calcareous spar (a cleavable variety); 4, fluor spar; 5, apatite; 6, feldspar; 7, rock crystal; 8, prismatic topaz; 9, corundum; 10, diamond (the hardest).

To decide the hardness of a mineral, first compare the specimen with No. 5, which is the medium, see then first if it can be scratched by apatite, if not, by the fluor spar; a few experiments of this nature will enable the observer to form a tolerably correct idea of its hardness. The next step is to try the specimen with the edge of a triangular file, holding the specimen on the edge of a table, a grating sound will be produced of more or less intensity

body compared with another of the same magnitude is the specific gravity.

If a cubic foot of water weighs 1,000 ounces and a cubic foot of iron weighs 7,000, their specific gravities as compared to each other is as 1,000 is to 7,000.

As there must be some standard of comparison which is readily available under any and all circumstances, distilled or river water has been adopted by common consent as that standard. It is evident that any body placed in water will displace its own volume of that fluid. That is to say, if a vessel be filled evenly full and a cubic inch of any substance introduced, water would run over which would exactly fill a cubic inch of space. A cubic inch of cork would displace the same volume of water as a cubic inch of gold or platinum. There are mechanical difficulties in this experiment which make it imperfect unless the body is very large. If we weigh a body in the air and then again weigh it suspended in water, it will be found to weigh less than before; this difference is the absolute weight of an equal volume of water. With this data we can readily calculate the specific gravity of any substance either lighter or heavier than water, by the following equations:

For bodies heavier than water—as the loss of weight a body sustains when weighed in

Improved Band Sawing Machine.

Why band saws frequently break is not difficult to understand. Forming, as the delicate thin ribbon of steel does, the sole connection between the pulleys over which it runs, it is obvious that, if one pulley be started into sudden motion, the saw must slip over the other pulley before the inertia of the latter is sufficiently overcome to allow of the imparting to it of a velocity, say of 400 revolutions per minute. Slipping produces friction, friction, heat and crystallization of the steel blade, and hence conditions are determined which, coupled with the strain set up, ultimately may break the saw. At the same time further injury may be done by the rubbing of the blade over the covering of the pulley. Various methods have been tested to avoid this trouble and of these the most common is making the upper wheel less heavy than the lower one. In the machine which we herewith illustrate a new plan is adopted, which admits of both wheels being constructed of the proper strength and weight.

In the rim of the upper cast iron pulley is formed a recess about five-sixteenths of an inch deep, which has a number of projections that are ground to a circle corresponding to the diameter of the wheel. The space between the projections is filled with plumbago, and over all is located a band of steel or other material, rolled true to the diameter of the projections. The band is open and after being placed in position is so closed as to allow of adjustability of its diameter. It is covered with leather or rubber, as desired. With this device, when the lower wheel is started before the inertia of the upper wheel is overcome, the band slides in the recess, rubbing on the projections, and the upper wheel is gradually set in motion without any friction taking place against the saw. As soon as its velocity equals that of the driving wheel the pressure of the band is sufficient to maintain the same, since it requires more power to slide the band on its axis. Now, when a piece of wood is put to the saw, it is obvious that the effect of the band is to equalize the speed of the wheels; and so, also, when the lower wheel is suddenly stopped, the upper one will expend its momentum in running on inside the band, the saw remaining at rest. It is usual to cover the upper wheel with elastic material which, to some extent, yields to the irregularity of motion.

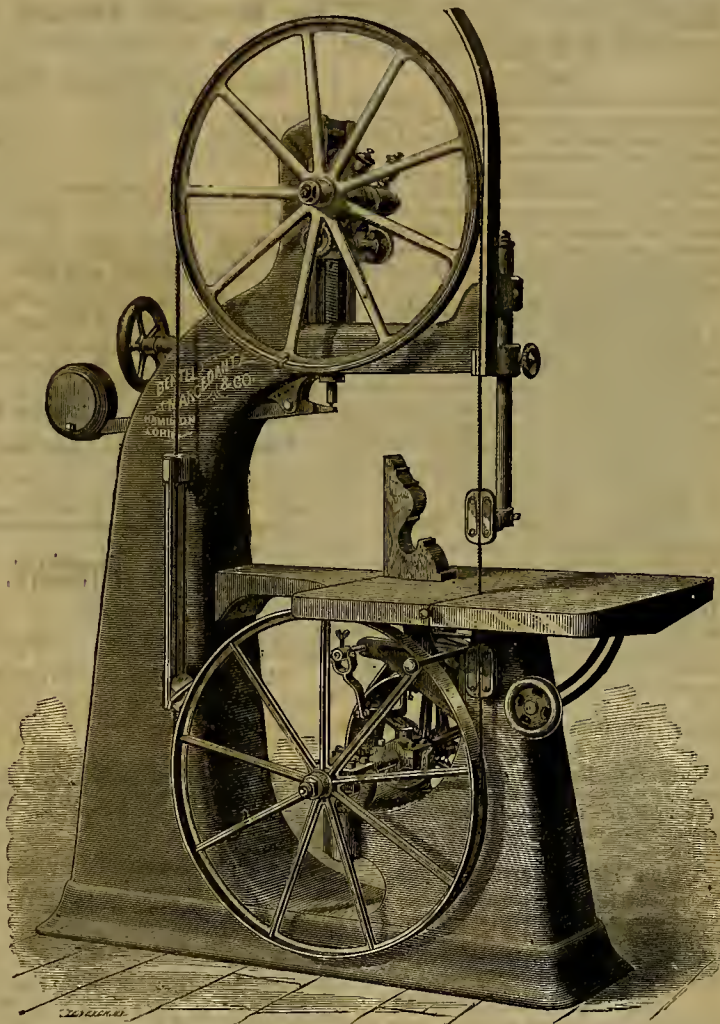
The manufacturers of this machine state that the band referred to forms an excellent elastic bed, as its tendency is to be thrown outward by centrifugal force, in opposition to which is the pressure of the blade.

The use of the band, it is further stated, permits the employment of a direct brake acting quickly and not endangering the lower wheel. To this end an improved clutch brake is arranged, which takes hold of the outside and the inside of the tight pulley rim, pressing at each side with equal force, so that its tendency is not to dislocate either pulley or shaft. By turning a small screw, friction may be increased or diminished, or wear compensated for. The saw guide consists of lateral and back thrust guides or supports. The former are flat pieces of wood on each side of the saw, which may be closed up to the blade and adjusted to compensate for wear. The back thrust guide consists of a series of chilled iron bells, with steel washers, bells and washers lying on each other alternately in a cylindrical inclosure drilled in the cast iron support. The back of the saw comes in contact with the balls through a groove in the cylinder; and as the balls rest only on the edge of small holes made through the supporting washers, all can be brought forward and adjusted to the back of the blade which, passing downward, rotates the bells without them. Devices are added which cause the balls to revolve irregularly, presenting gradually the whole surface of the ball to the support of the blade. By this general arrangement, it is claimed, the friction of the fast passing blade is reduced to a minimum, while heating is avoided.

The last improvement of the tour which constitute the principal features of the invention, is the device for making the adjustment, for steering the saw blade, more sensitive to the varying length of the letter. The short arm of a weighted lever presses against a regulating screw, which passes through horizontal miter gear, and engages therewith, by means of a slot and feather, to a nut on the idler wheel carriage. By turning a hand wheel connected to the miter gear, the carriage is raised and lowered on the guide slide. For changing the plane of rotation of the upper wheel, the journal boxes are connected by a circular flange provided with circular V slides. The latter are engaged and held by a sliding cross-head. Adjustment is made by a worm and screw, and is permanent and not affected by vibration.

This machine is manufactured by Bentel, Mergedant & Co., of Hamilton, Ohio, and received the first premium at the recent Cincinnati Industrial Exposition.

SATURDAY morning, while some men were working in the shaft of the Washington mine, near Hornitos, Merced county, about 30 feet of earth suddenly gave way, and falling upon one of the workmen, named John Williams, killed him instantly.



BENTEL, MERGEDANT & CO.'S BAND SAWING MACHINE.

sity as the specimen is hard or soft. The comparative mineral thought to be of the same hardness, is tested in the same manner until it is quite certain what test mineral is identical with it in point of hardness.

(3.) Luster. This word, as applied to minerals, is expressive of their surface appearance, and does not necessarily indicate high reflective power. There are six different kinds of luster recognized in mineralogy. 1, metallic, the luster of metals; 2, vitreous, like broken glass; 3, resinous, luster of yellow resins; 4, pearly, like pearl; 5, silky, resembling silk; 6, adamantine, the luster of the diamond, which must be seen to be understood.

There are four degrees of intensity to luster. 1, splendid, reflecting well defined images like a looking glass; 2, shining, producing an imperfect image by reflection; 3, glistening, reflecting from surface, but giving no defined image; 4, glimmering, reflecting imperfectly and apparently from points on surface.

A mineral is said to be "dull" when there is a total absence of luster, like a piece of chalk.

(4.) Diaphaneity. This property of minerals permits light to pass through them with different degrees of facility. When the outline of an object seen through a diaphanous mineral is perfectly distinct, the specimen is said to be transparent, for example, a piece of plate glass or a pure quartz crystal. When objects are seen, but indistinctly, (like ground glass), it is said to be semi-transparent. When light is transmitted but objects are not seen, it is translucent, like white wax or stearine. A mineral is sub-translucent when the thin edges only transmit light.

(5.) Specific Gravity. The weight of any

water is to its absolute weight, so is 1 to the specific gravity.

For bodies lighter than water—add a known weight sufficient to sink it in water to its weight in air; then, as the sum of these weights is to its weight in air, so is 1 to the specific gravity.

To take the specific gravity of a mineral, certain appliances will be required, which differ according to circumstances.

If the specimen is larger than an egg, a good common balance will give results sufficiently accurate for practical purposes. But if smaller, the balance must be delicate in proportion.

[To be Continued.]

The pottery and pipe factory at Bnena, Oregon, is quite a large and imposing structure. The main building is 16 by 116 feet, two stories high; the warehouse 40 by 60 feet, and the engine room 40 by 40 feet, and the furnace room 30 by 30 feet. This company proposes to erect a large kiln for the manufacture of pipe for water and sewerage purposes, to supply the increasing demand of Portland and Salem. A vein of fire clay has been tried and proves valuable for the manufacture of fire-brick, which have been in use for some time, and take the place of the English product.

A REPORT was circulated about Austin last week that there was trouble among the miners on Ruby hill. A number of claims are said to have been jumped, and the jumpers maintain a fighting interest thereto. It is stated some shooting had been indulged in, but with what result could not be ascertained.

The Sutro tunnel is now in 12,242 feet.

Mining at You Bet, Nevada County.

The Neere & West, Walooa, Red Dog and the Uncle Sam & Mallory, the latter also includes the Duryea purchase, are in the You Bet mining district, and are owned by an English company. Mr. G. S. Powers is the superintendent.

In the first named claim there is about 25 acres of good ground, which varies in depth from 50 to 250 feet. They are now washing to bedrock through a hedrock tunnel 1,250 feet in length. On the 30th of December a blast of 500 kegs of powder was exploded in drifts in this claim, which loosened up dirt enough for a two months' run. The outlet of this and the Walooa is Bird's Eye canon.

The Walooa contains 90 acres of ground, which varies in depth, but will average 150 feet. In this claim the superintendent is only washing off the surface.

The Red Dog, which is located at the village of Red Dog, about one and one-half miles from You Bet, contains 140 acres. They are washing to bedrock through an 800-foot tunnel and a 160-foot shaft. The gravel in this claim is from 100 to 250 feet thick. The outlet to the Red Dog is Green Horn canon.

The Uncle Sam & Mallory adjoins the village of You Bet, but as yet it is not developed. This claim is thought by many to be the best one owned by the company.

The company owns two ditches; one with a capacity of 1,800 inches of water. It is 12 miles long and takes its water from Steep hollow. The other takes its water from the north fork of Green Horn, and has a capacity of 1,800 inches. The ditches carry their full capacity of water for six or seven months every year.

The Hayward claim, Dave Rose superintendent, is about three-fourths of a mile north east from You Bet. They are raising three streams of water, and are pushing work right along. Another claim will soon be opened by this company.

The Hussey claim, John Hussey, superintendent, is north of and adjoins the Hayward. This is also a good paying claim.

Taken as a whole, the prospects in this mining district are very flattering, not only for the present but for the next fifty years to come. The gravel is there and the gold is in it, and the boys will tug away until every particle will be gathered in.—*Dutch Flat Forum.*

Tellurium.

An immense excitement has lately broken out in this region, at Sacramento and elsewhere, over the report that tellurium in great quantities had been discovered on Rock creek, one-fourth of a mile this side of Union Mills, seven miles from this place and within a hundred yards of Bear river. Until this discovery was made, probably few of our readers ever heard of that strange mineral, of a silvery whitish color, so scarce and highly prized as hardly to admit of any commercial value being placed upon it. From the best information we are able to collect, this metal is used by manufacturers of fine cutlery to give the keenest edge to engraver's tools, surgical instruments, razors, etc., it being supposed that the famous Damascus swords were edged with it; and as an instance of its great value, we are told that a manufacturing firm in San Francisco bought a single pound for which the small sum of \$3,000 was paid. A small mine in Siberia, one in Hungary and another in Utah, are, we believe, the only sources from which this metal is at present obtained.

The discovery on Rock creek was made in a tunnel of the Bear River mining company, opened in their search for iron, and the mineral is supposed to be contained in the ore at the rate of six pounds or more to the ton—enough to make the mine of fabulous richness, should there be no mistake in the matter.

Numerous claims have been staked off, notices posted, and stock is already selling at a lively rate.

The lead has been traced upward to near the McCourtney place, where it crosses the river and appears on the Placer county side. Another organized company have staked off claims at this point, and will at once proceed to business.—*Wheatland Free Press.*

THE TEMESCAL TIN MINES.—There is a prospect of an early resumption of operations in the Temescal tin mines in San Bernardino county. These mines are situated about 24 miles southeast from the new settlement known as Pomona. During the past 10 years but little labor has been performed in these mines on account of a conflict in regard to the title. The property is reputed to be immensely valuable, and it is unfortunately that an industry of so much importance should languish on account of a wrangle over the right of possession. But it appears that the conflicting interests will soon be smoothly straightened out, and that a company of foreign capitalists will vigorously take hold of the work. The prospective operators are wealthy gentlemen from Amsterdam, who are engaged in importing tin from the United States on an extensive scale. The value of the tin annually imported by them is given at \$14,000,000. It is stated that they have bonded the Temescal tin mines from the various claimants to the amount of \$80,000, and that the money will be paid on the 1st of May next, and it is believed that the resumption of mining operations will greatly benefit business and property interest in that section.—*Los Angeles Land Journal.*

[PUBLISHERS' ANNOUNCEMENT.]

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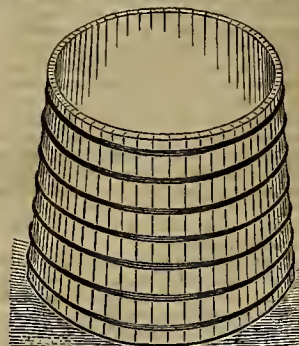
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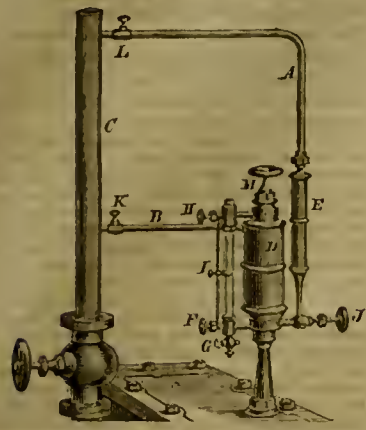
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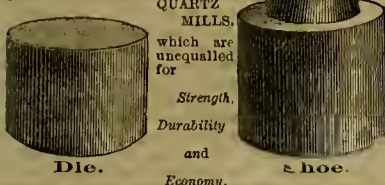
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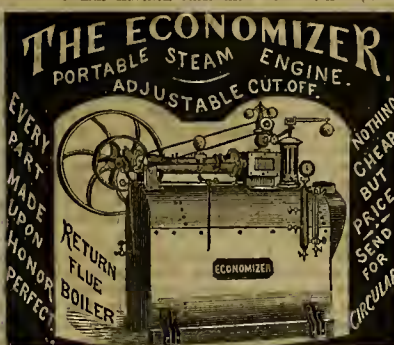
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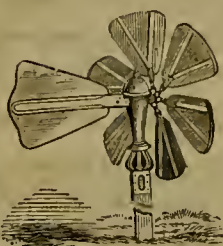
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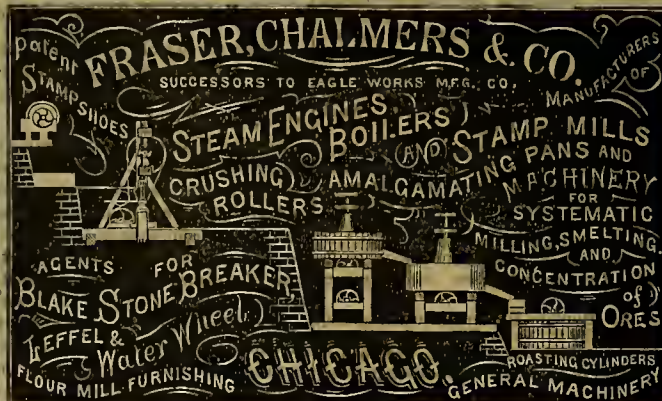
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(Continued from Page 133.)

to five or six feet in depth in the main drifts.

SURF TUNNEL.—The main header continues to be pushed forward at a very good rate of progress; material somewhat harder than last week. More quartz streaks are coming in, with a slight increase of water. Total length of tunnel, 1244 feet.

OSMOPOLIS.—Main tunnel north, following the vein, shows well in its face, being all in low grade ore with occasional rich streaks. The winze below that level is in good pay ore most of the way, and it seems to be widening it.

BELOCHER.—Daily yield, 450 tons of ore, keeping the mills on the Carson river running up to their full capacity. The shutting down of the mine a week ago and the stopping of the extraction of ore for a few days will make no difference in the yield of the mine for the month, as the mills had a plentiful supply of ore on hand. The grading for the new 400-horse power pumping engine is making good headway. Sinking the air shaft is going steadily ahead without hindrance of any kind whatever.

MORNING STAR.—Sinking the shaft is going rapidly forward. There is no water to contend with and the rock blasts out easy and works well.

WELLS-FARGO.—The east drift at the 500-ft level is now in 175 feet. It has been running in a strata of very hard porphyry of late, but it is getting softer, with indications of water.

MEXICAN.—The north drift on the 1465-ft level is being again advanced at a very fair rate of speed, the fact in quartz and ledge matter of a very favorable character.

GOULN & CURRY.—Repairing the shaft is nearly completed. Work on the lower levels will be resumed in a very short time.

KNICKERBOCKER.—The water is drained from the shaft, and work has been resumed on the lower levels.

ELY DISTRICT.

LOCAL MATTERS.—Pioche Record, Feb. 13: For the week commencing Sunday, the 6th inst., there has been shipped by Wells, Fargo & Co.'s express, bullion to the amount of \$51,251, which shows that Pioche is now doing the bulk of the bullion shipping and coming up in the old style. The pump on the Raymond & Ely mine has continued to work to the satisfaction of every one, the shaft being kept dry by about 17 hours working in 24, whilst sinking is steadily continued. We may at any time expect to record developments that will be of immense importance to Pioche, for as soon as the Raymond & Ely make a strike it will tend to place money in the other mines of Pioche to develop their resources. Taking the mining outlook throughout we think we can congratulate ourselves on being in a better condition financially than we have for two years past.

ALPS MINE.—During the past week from 15 to 16 tons of ore have been daily extracted, this ore being shipped to the Floral mill for reduction. The ore has worked well and given entire satisfaction to the superintendent. The mine shipped from the 17th to 27th of January \$17,294.

RAYMOND & ELY.—The pump of this mine is now working six, seven and sometimes eight strokes per minute, by which they manage to keep the shaft perfectly dry, running it about 17 hours out of 24. The progress of sinking is continued as rapidly as possible. On the eighth, ninth and tenth levels work is progressing. Ore which has heretofore pulped \$16, averages from \$135 to \$140. The constant increase of bullion and the large shipments of ore show the Raymond & Ely mine is a first-class one. If it was situated in Virginia City the stock would be rating at \$100 per share instead of \$22. However, it will not be long before a good strike will put it at large figures.

Oregon.

THE VIRTUE.—Oregon Sentinel, Supt. M. Hyde, of the Virtue mine, at Baker City, has shipped 436½ ounces of bullion, valued at \$9,000, to San Francisco, the result of 12 days' run with 20 stamps. This is the second shipment from this mine for the month of January, making a total of \$15,000 for this month. The new working shaft has reached a depth of 100 feet, and is being sunk at the rate of 15 feet per week. The vein of ore in the mine averages two feet. Between the first and second level north of the main tunnel, the ledges averages two feet, with a slope of 120 feet, and over 400 feet long solid ground. Here is found the richest rock ever found in Eastern Oregon.

CONNER CREEK.—Zelrock Democrat, Feb. 9: We are informed by Mr. S. B. McCord, who has just returned from Conner Creek, that the future prospects of that camp are looking up. Sleeper & Co. have added some new machinery to their quartz mill, and it was intended to start up this next week. White & Co. are now running their water quartz mill with five stamps, and will start their steam quartz mill, with 10 stamps, in a few days. From all the information Mr. McCord could obtain and observe, the White company ledge was in fine condition and prospects well in rich rock. He informs us that the miners there are in good spirits and expect a prosperous coming season.

THE MINES NEAR FORT LAKE.—Oregon Sentinel, Feb. 9: From parties who have visited the recently discovered placer mines in the neighborhood of Fort Lake, we learn that the mine is paying handsomely, and that a nugget of gold weighing some \$16 or \$17 was picked up one day last week. These mines were discovered in this wise: The water running through a rut which had been made by wagons bringing wood from that vicinity had washed the gold free from the earth, which was discovered by some parties who immediately took up the ground in that vicinity, and have been working at the same for the past few weeks. Some idea of their richness can be formed when we state that after washing up a piece of ground, not over eight or 10 feet in width and about 15 feet in length, \$200 was the result of the clean up. There have been some 20 acres taken up in that vicinity, but whether it will all prove as valuable as this, we have no means of knowing.

Utah.

LITTLE COTTONWOOD MINES.—Correspondence Salt Lake Tribune, Feb. 14: Since the beginning of the Centennial year we have been having snow in abundance. In the morning it is snowing, at noon it storms, and at night it is a regular juncane, that the bravest hesitate to face it. Old Sol seldom shows his smiling face, and a sight of him would now be a sure cure for sore eyes. The beautiful has accumulated to a depth of about 12 feet on the level. Business is dull, as may be expected, as it has been so long since the snow has melted, and the miners are compelled to do so through necessity. The trails to the mines are blocked most of the time and but little ore can be moved till the storm lets up. The ore haulers are having a rough deal this winter. The mines are still pounding away, and piling up plenty of good ore, so that when the road and trails are again passable, there will be a big lot of it rushed down the canon in a hurry.

MINERS are beginning to start from Virginia and vicinity for the Black hills, and several parties are making up to start early in the spring. Five faro sharps have also left from the same place to give the gold hunters a chance.

WHILE some men were working in the shaft of the Washington mine, near Hornitos, about thirty feet of earth suddenly gave way, and falling upon one of the workmen, named John Williams, killed him instantly.

General News

NEW MEXICO wants to be a State.

THE Cuban treasury is bankrupt.

ALFONSO'S successes are just now the order of things in Spain.

CHARLOTTE CUSHMAN is dead. Her estate is valued at \$600,000.

THE San Francisco school department is sadly in want of funds.

THE Danube has overflowed and inundated the entire suburbs of Vienna.

An attempt is to be made to introduce Granger societies in England.

RUMORS of the intended retirement of Secretary of the Treasury Bristow, continue.

AN OFFICIAL Russian ukase forbids women executing the functions of barristers.

THE submarine cable between Sydney and New Zealand has been successfully laid and opened for traffic.

THE passengers and crew of the steamship City of Galveston have arrived at Nashua after suffering severe privations.

RUMORS of the prospective consolidation of the Anglo-American and Direct cable companies are again in circulation.

THE Supreme Court has decided that minors leading an idle and dissolute life may be committed to the Industrial school without trial by jury.

MARK TWAIN is said to be writing a five-act play, the scene of which is laid partly in San Francisco and partly in the Nevada silver mines.

DR. HELMROTH has been declared insane by the Commissioners in Lunacy appointed by the court in Philadelphia, and will be placed in a proper asylum.

A COLORED MEMBER of the Virginia House of Representatives has been expelled for abstracting money from the pay book of the Sergeant-at-Arms.

THE suspension of work in the Pennsylvania coal region throws about 60,000 men out of work. Over production is the cause. Work will be resumed March 11th.

THE temperance organizations at Buffalo have secured a fund of over \$10,000 to prosecute violators of the Sunday excise law. Thirteen prominent saloon keepers have been arrested.

"FOSTER" won the great four mile and repeat race for \$30,000 on Washington's birthday. The race was witnessed by 25,000 people. Time 7.38-7.53. The second horse was "Rutherford."

THE John Hopkins University in Baltimore, presided over by Professor Gilman, late of the California University at Berkeley, was opened February 22d, in the temporary buildings fitted up in that city.

THE Kern Valley bank, at Bakersfield, was robbed of \$27,000 on the night of the 18th inst. The bank manager, who was in the building, was knocked down and stupefied with chloroform.

A Times Paris dispatch it seems to me now decided that as soon as the Carlisle war is over Queen Isabella will enter Spain. King Alfonso will meet her at the frontier and conduct her to the capital.

RICHARD B. IRWIN, former agent of the Pacific Mail steamship company, has been arrested on complaint of Rufus Hatch, managing director, on the charge of having embezzled \$750,000, the property of the company. Irwin gave bail in \$50,000.

THE loss of life by the sinking of the steamer Strathside, in the English channel, in a collision with the steamer Franconia on the 17th inst., was frightful. Over 60 persons, it is said, went down with the vessels. Only a few of those on board were saved.

HENRY W. LONGFELLOW, Oliver Wendell Holmes, Ralph Waldo Emerson and 600 other professional and scientific gentlemen have petitioned Congress for the admission, duty free, of all books printed in other than the English, Latin and Greek languages.

A WASHINGTON dispatch says: In justice to Minister Schenck, the President will not accept his offer to resign until the investigation of the Emma mine scandal, ordered by the House, is concluded. It is now charged that among the parties who participated in the half million dollars expended in Washington, in connection with the Memphis-El Paso lobby years ago, were several present members of Congress and General Schenck.

ALL the material for the new water works at Virginia City is now on the way. The heaviest contracts have been let, and work on the mains will begin about May 1st, the present cold weather and frozen ground preventing work at present. Three large gradings have been made to accommodate the reservoir—one on the Ophir, another on Mount Davidson, on a line with Taylor street, and the third on the hill above the Ballou mine. All the piping and material ordered is of the best and most solid description, and purchased with a view to stand heavy pressure and the wear and tear of time.

THE reduction furnace of the North Almaden quicksilver company, which was leased by Captain J. H. Adams & Co. for the reduction of cinabar from the South Almaden claim, was started last Monday, and is now at work constantly.

PATENTS & INVENTIONS.**A Weekly List of U. S. Patents Issued to Pacific Coast Inventors.**

FROM OFFICIAL REPORTS FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.]

By Special Dispatch, Dated Washington D. C., Feb. 22d, 1876.

FOR WEEK ENDING FEBRUARY 8TH, 1876.*

SURGICAL BEDSTEAD.—Oliver Allen, Petaluma, Cal.

ELECTRO-MAGNETIC TRIPPING AND RECORDING MECHANISM.—Robert Bragg, S. F., Cal.

STIRRERS FOR ORE ROASTING FURNACES.—Jas. Brodie, S. F., Cal.

VEHICLE SPRINGS.—Eli Huntsington, Sacramento, Cal.

ICE MACHINE (four cases).—Samuel B. Martin, S. F., Cal.

HARVESTER.—Jas. F. Place, S. F., Cal.

APPARATUS FOR TREATING HIDES.—Charles L. Royer, S. F., Cal.

CONGREGATORS FOR ICE MACHINES.—David Smith, S. F., Cal.

HARVESTER.—Henry D. Willard, Vacaville, Cal.

REISSUE.

ALARM AND FARE REGISTERING MECHANISM.—Isaac Hyde, S. F., Cal.

*The patents are not ready for delivery by the Patent Office until some 14 days after the date of issue. NOTE.—Copies of U. S. and Foreign Patents furnished by Dewey & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s Scientific Press American and Foreign Patent Agency, the following are worthy of mention:

ELECTRO-MAGNETIC POWER GENERATOR.—Robert Bragg, San Francisco. The object of this invention is to provide an arrangement by which sufficient power can be obtained from the action of an electro-magnet and its armature to perform certain stated duties. For the purpose of explanation, the arrangement and operation of the invention may be described with special reference to its application in fire engine houses, in which it can be used for the purposes of releasing the horses from their stalls, ringing bells, awakening the firemen, turning up the gas, opening doors, and for various other purposes, all of which can be accomplished by the electric current which transmits the alarm to the different engine houses, thus operating the various devices with which it is connected simultaneously. The wire of the fire alarm is connected with an electro-magnet, so that when an alarm is telegraphed the electric current will pass through the magnet and cause the armature to be drawn up against it. An upright trip bar, which is pivoted at its lower end, has a circular notch formed on one side of its upper end. A weight is arranged to slide up and down beside the trip bar, and this weight has a roller on one side, which can be caught on the notch in the trip bar when it is desired to suspend the weight and set the device. The armature has a shank which passes through a slot in a metal loop, which is secured to the edge of the bar opposite the magnet, and the end of the shank is headed on the inside of the loop. A spring serves to keep the armature drawn back away from the magnet. Now it is evident that when the electric current enters the magnet the armature will be drawn up against it, thus releasing the weight from the notch in the trip bar and allowing it to drop. This weight can be connected directly with the device to be operated, or it may be connected with and made to operate another trip bar, which will drop a heavier weight, in order to aggregate the power when necessary. The system of dropping weights is the subject of a former patent to the same inventor. Mr. Bragg also provides for registering the strokes of the armature, and as the strokes of the armature will correspond with the number of the box from which the alarm proceeds, the register will indicate that number properly. To do this he arranges a bar to slide vertically past the armature. This bar is operated by clock work, which is set in motion by the movement of the armature. To the shank of the armature is attached a pencil, which will mark across the passing rod each time the armature moves against the magnet, thus registering the number of the box, so that a mistake in counting the strokes of the alarm bell or gong can be rectified. In Mr. Bragg's former patents these tripping devices were operated by the hammer of the gong, but it is often desirable to have two or even more sources of power, so that each one can perform a specific duty. By the present arrangement he can employ any desired number of magnets and thus operate an equal number of separate weight powers, each one of which performs a separate duty. A spring could be used in place of the suspended weights, but its application would be substantially the same as for the weight.

IMPROVED FRACTURE BEDSTEAD.—Oliver Allen, Petaluma. This inventor provides a bedstead with all of the necessary appliances and conveniences for reducing and curing fractures of those bones in the human anatomy which require extension in order to keep the fractured parts in opposition while lesion is taking place. The bed is made with a solid bottom of boards, as such a bottom is better adapted to the various devices which are to be attached to the bed. A very complete and convenient combination of devices for reducing and curing fractures is provided. The parts of which the bed is composed can be readily taken apart, so as to permit of their being stowed in a small compass for transportation. The bed can thus be taken to the patient without trouble. By following the plan and employing the various devices described in the patent, fractures can be cured without shortening of the limb, while the patient is kept comparatively comfortable, and all his wants supplied without disturbing his position. If the bandage should become irksome its position can be shifted by securing a second bandage in another place and connecting it with the rear "stud" on the bed, which is made larger than the front one, to permit of the bandage being attached to it without interfering with the front stud. When this second bandage is perfectly adjusted the first one can be removed, thus changing the location of the bandage without disturbing the extension of the limb. A detailed description of this bed with its various devices would be imperfect without proper engravings to make it intelligible.

IMPROVEMENT IN HEADERS.—Henry D. Williams, Vacaville, Solano county. This improvement in headers for cutting grain consists in the use of a supplemental frame, carrying the elevator belt or draper, and so hinged or connected with the main frame that the two may be depressed for low grain without changing the level of the draper. It also consists in coupling the tongue to the main frame in a line with the axles, so that the driver has complete control of the machine, without being obliged to lift against the pushing of the team. All farmers are aware that with the usual style of headers, especially with the short frame and high wheels, there is always a great loss of grain when the straw is at all short, as the angle of the whole machine has to be so great in order to cut close to the ground that the grain is constantly rolling off the cutter bar and draper. With this machine that fault is remedied, while the inventor is still able to retain the advantages of the short frame and high wheels, because the frame is retained in a nearly level position, whatever may be the change in the angle of the main frame in depressing the front end and the cutters. By coupling the tongue in a line with the axles of the driving wheels the driver has complete control of the machine, without being obliged to lift against the pushing of the team, and the tongue is maintained at all times in a horizontal position, no matter how much the frame may be elevated or depressed.

ADJUSTING ATTACHMENT FOR HEADERS.—James F. Place, S. F. This improvement in headers consists of an attachment by which the inventor is enabled to retain the point of draft at the front of the machine and in a line with the pole, whatever change may be made in the elevation of the sickle bar and cutter for high or low grain. In the construction of headers which are driven by a team of horses attached to a pole projecting behind the header frame, this pole is usually hinged to the rear of the frame, either permanently or by means of adjustable plates. In the former case, whenever the cutters are depressed by raising the adjusting lever, an obtuse angle is formed between the pole and the header frame, thus making a sort of knee lever, against which the adjusting lever must be moved by a very great outlay of strength. If adjusting plates are used, it will be manifest that they would be practically useless in grain which varies in strength in different parts of the same field. In the construction patented by Mr. Place, he changes the fulcrum or point of support, about which the header frame works, from the rear to the front, and by this change the adjustment of the cutters for high or low grain is easily effected and without the outlay of much strength.

THE business of the Omaha smelting and refining works during 1875 was as follows:

Shipments of gold and silver.....	\$2,226,611
Shipments of lead.....	11,170 tons
Shipments of anti-friction metal.....	422 tons
Coke consumed.....	207 cars
Coal consumed.....	1,089 cars

There were received at the works during the year 1,277 cars of base bullion, (argenteiferous lead), 40 cars of ore, and four cars of soda. The number of men employed was 135, and the pay roll was over \$4,000,000.

THE Consolidated Virginia mining company has moved its assay office from the Savage assay office, which it has used since the fire, to its new building near its works.

SEVERAL abandoned gravel and quartz claims in Calaveras county are being reprospected with gratifying success.

RICH copper deposits have been discovered in Fresno county.

Mineral Land Patents.

Copp's Western Land Owner for February announces the following mineral patents issued during January:

California—Calaveras County—Joseph D. Royder, Royder placer; David B. Hughes, et al., Hughes & Son's Deep Gravel Mine; Alexander Queral, Paul Consolidated placer; John Jackson, et al., Union Shaft placer; Julius Bandmann, placer. El Dorado County—Anton Bentler, et al., Union Tunnel placer; Thomas Crushon, Plattaville placer; Joseph Immer, Brush Creek placer; Charles E. McLane, Dorsey & Bell, placers. Nevada County—Jacoo Arbogast, Rock Creek placer; William Rankin et al., Blue Bank Gravel Mine; Cold Spring and Blue Gravel Mining Company, Cold Spring and Blue Gravel Mine. Placer County—James L. Gould, Canon Creek Hydraulic and Blue Gravel Mine. Plumas County—Nicholas Gard, et al., placer. Yolo County—California Quicksilver Mining Company, Soda Spring.

Oregon—Royal Quicksilver Mine. Colorado—Boulder County—H. C. Brown, Forrest Lode. Park County—Charles Bamberg, German Lode.

Montana—Madison County—W. T. Harris, et al., placer.

Nevada—Storey County—Georgia Silver Mining Company, Washington Lode, Lyon County—Quinn Mining Company, Quinn Lode. Ormsby County—Athens Gold and Silver Mining Company, Athens Lode.

Oregon—Coos County—Simon K. Lane, et al., Pioneer Gold Placer.

Utah—Salt Lake County—Monroe Salisbury, Ohio River Mine.

OLIVE OIL.—One of our city dailies remarks that it may not be generally known that a considerable quantity of California olive oil is finding an appreciative market here, and is coming into quite general use in our hotels and restaurants. Samples of the oil were recently submitted by a prominent restaurant keeper to a party of his patrons, who were good judges of the article, for an opinion. After critically testing it, they unanimously reported it to be a first-class article, and were much astonished on being informed that it was of California production. The article is put up by parties at Los Angeles in cans and cases, and is sold here at a slight reduction from the rates of imported oil. Owing to the prejudice against home products, the agents have been obliged to label it Plagniol, a well known French brand.

JUMPERS.—The party of jumpers who took forcible possession of the Bunnel mine, near Bakersfield, last week, still remain in charge. They have constructed their dwelling at the mouth of the tunnel, erected fortifications of rock around it, challenge every man travelling that way, and allow no one to enter the premises. The report having been made that the party was moving over from the mine in disobedience to the injunction issued from the district court, steps have been taken to effect their arrest and commitment for contempt, but the overpowering force of about thirty men, armed with shotguns and revolvers, bids defiance to all adverse claimants and the authority of the officers of the law, and a row is expected if any attempt is made to eject them.

The shipments of coal from Seattle, Washington Territory, in January this year were 5,440 tons, against 1,933 tons in the same month of 1875.

The Ophir mine has already quite a town about it; the buildings now cover 10 acres of ground, and new structures are going up constantly.

ALFRED MURRISH, a miner at Dutch Flat, fell down the shaft of the Badger mine, a distance of 90 feet, Monday, and was instantly killed.

The Crown Point miners have presented Mrs. Jane Hill, whose husband was killed by a giant powder explosion a few weeks ago, with \$650.

BOTH the Savage and the Alta mines are to have heavy pumping machinery similar to that of the C. & C. shaft.

The ledge on the 340 ft level of the Lady Bryan mine on the Comstock, is 140 feet wide.

FIRST CLASS hoisting works are to be put up at the North Carson mine, on the Comstock.

RICH mines have been recently discovered near Swatee, Baker county, Oregon.

The Consolidated Virginia is at present employing 274 miners.

SANTA MONICA will have a planing mill.

THE STANLEY RULE AND LEVEL COMPANY, of New Britain, Conn., have reduced the prices of Bailey's Patent Adjustable Planes, both iron and wood. Send your address on a postal card and receive from them an illustrated circular of these and other superior tools.

Nothing racks the frame like a violent cough; yet nothing is more readily cured. It is only necessary to take HALE'S HONEY OF HOREHOUND AND TAR according to directions.

Pike's Toothache Drops cure in one minute.

WOODWARD'S GARDENS embraces an Aquarium, Museum, Art Gallery, Conservatories, Tropical Houses, Menagerie, Seal Ponds and Skating Rink.

METALS.

[WHOLESALE.]

WEDNESDAY M., February 23, 1876.

American Pig Iron, #100	39 00	38 00
Scottish Pig Iron, #100	35 00	37 00
White Pig, #100	35 00	37 00
Oregon Pig, #100	35 00	37 00
Refined Bar, bad assortment, #100	35 00	37 00
Refined Bar, good assortment, #100	35 00	37 00
Boiler, No. 1 to 4	35 00	37 00
Plates, No. 5 to 9	35 00	37 00
Sheet, No. 10 to 14	35 00	37 00
Sheet, No. 15 to 19	35 00	37 00
Sheet, No. 20 to 24	35 00	37 00
Sheet, No. 25 to 29	35 00	37 00
Horse Shoes, per keg	6 00	5 00
Nail Rod	10 00	10 00
Norway Iron	9 00	9 00
Rolled Iron	6 00	6 00
Other Irons for Blacksmiths, Miners, etc.	10 00	10 00

COFFEE—		
Braziers	35 00	35 00
Copper Tins	37 00	37 00
O'Neil's Pat.	37 00	37 00
Sheathing, #1	25 00	25 00
Sheathing, Yellow	25 00	25 00
Sheathing, Old Yellow	25 00	25 00
Composition Bolts	24 00	24 00
STEEL—English Cast, #1	20 00	20 00
Anderson & Woods' American Cast	20 00	20 00
Drill	18 00	18 00
Flat Bar	18 00	18 00
Pivot Steel	9 00	9 00
TRIP LATHES		
10x14 1/2 Charcoal	10 50	11 00
10x14 1/2 X Charcoal	12 50	13 00
Roofing Plate 1 C Charcoal	10 00	10 50
Cornelian	25 00	25 00
Australian	18 00	20 00
ZINC—By the Cask	11 00	11 00
Zinc, Sheet 13 1/2 ft, No 7 to 10 #1	11 00	11 00
Jodot, 3 Kil, per doz	82 00	82 00
Jodot, 11 to 13 Kil, per doz	82 00	82 00
Jodot 14 to 16 Kil, per doz	82 00	82 00
Jodot, second choice, 11 to 13 Kil, #1 doz	82 00	82 00
Cornelian, 12 to 15 Kil	57 00	57 00
Cornelian Females, 12 to 13 Kil	63 00	67 00
Cornelian Females, 14 to 16 Kil	71 00	75 00
Simon Ulmo Females, 12 to 13 Kil	58 00	62 00
Simon Ulmo Females, 14 to 15 Kil	68 00	72 00
Simon Ulmo Females, 16 to 17 Kil	72 00	74 00
Simon, 18 Kil, #1 doz	61 00	63 00
Simon, 20 Kil, #1 doz	65 00	67 00
Simon, 24 Kil, #1 doz	72 00	74 00
Robert, 7 and 9 Kil	25 00	25 00
French Kips, #1 doz	1 00	1 00
California Kid, #1 doz	40 00	40 00
French Sheep, all colors, #1 doz	3 00	15 00
Eastern Calf for Backs, #1 doz	1 00	1 00
Sheep Roans for Topping, all colors, #1 doz	9 00	13 00
Sheep Roans for Linings, #1 doz	5 50	10 00
California Russell Sheep Linings, #1 doz	1 50	4 00
Best Jodot Calf Boot Legs, #1 pair	5 00	5 00
Good French Calf Boot Legs, #1 pair	4 00	4 00
French Calf Boot Legs, #1 pair	4 00	4 00
Harness Leather, #1 doz	24 00	22 1/2
Fair Bridle Leather, #1 doz	48 00	42 00
Whirling Leather, #1 doz	33 00	31 1/2
Well Leather, #1 doz	30 00	28 1/2
Suit Leather, #1 foot	17 00	17 00
Wax Side Leather, #1 foot	17 00	17 00

LEATHER.

[WHOLESALE.]

WEDNESDAY M., February 23, 1876.

City Tanned Leather, #1 doz	22 00	22 00
Santa Cruz Leather, #1 doz	22 00	22 00
Country Leather, #1 doz	22 00	22 00
Stockton Leather, #1 doz	22 00	22 00
Jodot, 3 Kil, per doz	82 00	82 00
Jodot, 11 to 13 Kil, per doz	82 00	82 00
Jodot 14 to 16 Kil, per doz	82 00	82 00
Jodot, second choice, 11 to 13 Kil, #1 doz	82 00	82 00
Cornelian, 12 to 15 Kil	57 00	57 00
Cornelian Females, 12 to 13 Kil	63 00	67 00
Cornelian Females, 14 to 16 Kil	71 00	75 00
Simon Ulmo Females, 12 to 13 Kil	58 00	62 00
Simon Ulmo Females, 14 to 15 Kil	68 00	72 00
Simon Ulmo Females, 16 to 17 Kil	72 00	74 00
Simon, 18 Kil, #1 doz	61 00	63 00
Simon, 20 Kil, #1 doz	65 00	67 00
Simon, 24 Kil, #1 doz	72 00	74 00
Robert, 7 and 9 Kil	25 00	25 00
French Kips, #1 doz	1 00	1 00
California Kid, #1 doz	40 00	40 00
French Sheep, all colors, #1 doz	3 00	15 00
Eastern Calf for Backs, #1 doz	1 00	1 00
Sheep Roans for Topping, all colors, #1 doz	9 00	13 00
Sheep Roans for Linings, #1 doz	5 50	10 00
California Russell Sheep Linings, #1 doz	1 50	4 00
Best Jodot Calf Boot Legs, #1 pair	5 00	5 00
Good French Calf Boot Legs, #1 pair	4 00	4 00
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Harness Leather, #1 doz	24 00	22 1/2
Fair Bridle Leather, #1 doz	48 00	42 00
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Well Leather, #1 doz	30 00	28 1/2
Suit Leather, #1 foot	17 00	17 00
Wax Side Leather, #1 foot	17 00	17 00

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by CHARLES SUTRO & Co.]

SAN FRANCISCO, February 23, 3 P. M.

LEGAL TENDERS IN S. F., A. M., 8 1/4 to 8 3/4.
Gold in N. Y. 114 1/2.
Gold Bars, 990. SILVER BARS, 8 and 11 per cent discount.

EXCHANGE ON N. Y., 60-100 per cent premium for gold; on London bankers, 49; Commercial, 49 1/4; Paris, five francs per dollar; Mexican dollars, three to five per cent discount.

LONDON—Onsols, 93 to 93 1/2; Bonds, 102 1/2.
QUEENSLAND IN S. F., by the bank, per lb. 72 1/2 to 75.

Just Published.

THE PUBLIC LANDS

OF CALIFORNIA

AND

U. S. LAND LAWS

With a Map of California and Nevada.

A BOOK OF INFORMATION,

Especially valuable to Immigrants and Pre-emptors, and interesting to the public generally.

Contains a general statement of amount of Public Lands now open to pre-emption; Rail road Lands, and where they are situated, how reached; and general instructions for locating and holding.

Contains, also, facts of general interest to all in regard to the chief industries of California. Compiled by H. M. VAN ARMAN.

PUBLISHED AND SOLD BY DEWEY & CO., PUBLISHERS OF THE PACIFIC RURAL PRESS, SAN FRANCISCO, CAL.

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Examinations of Patents made here and a

Washington.

Examinations Ordered and Reported by TELE-

GRAPH.

Examinations made of Assignments Recorded

in Washington.

Interferences Prosecuted.

Opinions Rendered regarding the Validity of

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DEWEY & CO.

"Faith and Confidence"

LIVERMORE, Oct. 1st, 1875.

MESSRS. DEWEY & Co., Patent Solicitors: Gentlemen—Yours of the 29th ult. containing my patent to Elevated R. R. duly received, and I hereby return my sincere thanks to the MINING AND SCIENTIFIC PRESS Agency for your promptness and honesty in regard to our business connections. I have received a flood of circulars from Eastern firms, desiring to deal with me, but I have declined any communication with them and prefer, as soon as circumstances will permit, to negotiate with and patronize a home institution; one in which I have faith and confidence—DEWEY & Co. Again thanking you for your promptness in securing my patent, I remain, obediently yours,

WM. H. HARRISON.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

J. L. THARP—San Francisco.

R. W. CROWLEY—California.

JOHN ROSTROFF—California.

G. W. McGREW—Santa Clara county.

J. M. McANTRUM—Los Angeles, Santa Barbara, Ventura, San Bernardino and San Diego counties.

J. W. RILEY—San Francisco.

APPEALATION ABROAD.—We copy the following from the *Mining and Monetary Gazette*, of London, Eng.: "We deemed it advisable, as affording valuable information to our readers, to publish in recent issues of *The Gazette*, the full text of the 'United States Mining Laws and Instructions, by the Commissioner of General Land Office,' taken from our talented contemporary, *The Mining and Scientific Press*, of San Francisco. The documents have now been issued in a handsomely bound volume by Messrs. Dewey & Co., the publishers of our transatlantic contemporary, and it will be found very useful to those already interested in American mines, and to others who may be tempted to embark in that enterprise in the States."

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

California Acclimatizing Society—Loca-

tion of principal place of business, San Francisco, Cal. Notice is hereby given, that at a meeting of the Board of Directors, held on the fifth day of February, 1876, an assessment of fifty cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold and silver coin, to the Secretary, at the office of the company, room No. 37, Nevada block, northwest corner of Pine and Montgomery streets, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the fourteenth day of March, 1876, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the third day of April, 1876, to pay the delinquent assessment, together with costs of advertising and expenses of sale. W. W. TRAYLOR, Secretary, pro tem. Office, room 37, Nevada block, San Francisco, Cal.

Eureka Stone Manufacturing Company—

Location of principal place of business, San Francisco, California.

Notice is hereby given, that at a meeting of the Board of Directors of said company, held on the twenty-sixth day of January, 1876, an assessment (No. 3) of ten cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, No. 567 Market street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the first day of March, 1876, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Wednesday, the twenty-second day of March, 1876, to pay the delinquent assessment, together with costs of advertising and expenses of sale. C. D. MOWELL, Secretary.

Office, No. 567 Market street, San Francisco, Cal.

Josephine Gravel Mining Company—

Principal place of business, San Francisco, Cal. Location of works, Brushy Canyon, Placer county, Cal.

Notice is hereby given, that at a meeting of the Board of Directors, held on the twenty-third day of February, 1876, an assessment of ten cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold and silver coin, to the Secretary, at the office of the company, 431 California street, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the twenty-fifth day of March, 1876, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the tenth day of April, 1876, to pay the delinquent assessment, together with costs of advertising and expenses of sale. WM. SMALL, Secretary.

Office, No. 531 California street, San Francisco, Cal.

Mariposa Land and Mining Company of

California. Location of principal place of business, San Francisco, Cal. Location of works, Mariposa county, Cal.

Notice is hereby given that at a meeting of the Board of Directors, held on the twenty-third day of February, 1876, an assessment (No. 4) of one dollar per share was levied upon the capital stock of the corporation, payable immediately in United States currency to the Secretary, at the office of the company, room 35, Nevada block, No. 299 Montgomery street San Francisco, Cal. or to the Assistant Secretary, at the office, No. 9 Nassau street, New York, N. Y.

Any stock upon which this assessment shall remain unpaid on the twenty-fourth day of March, 1876, will be delinquent, and advertised for sale at public auction, and unless payment is made before will be sold on Monday, the tenth day of April, 1876, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

LEONARD L. FAY, Secretary.

Office, room 35, Nevada block, No. 299 Montgomery street, San Francisco, Cal.

Moore's Flat Blue Gravel Mining Com-

pany. Location of principal place of business, San Francisco, Cal.

Notice.—There are delinquent upon the following described stock, on account of assessment levied on the twentieth day of December, 1875, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Am't.
Noon, John J.	27	1000	\$100 00
Noon, John J.	28	1000	100 00
Noon, John J.	29	1000	100 00
Noon, John J.	30	500	60 00
Noon, John J.	31	500	60 00
Noon, John J.	32	100	10 00
Noon, John J.	33	100	10 00
Noon, John J.	34	100	10 00
Noon, John J.	35	100	10 00
Noon, John J.	36	100	10 00
Noon, John J.	37	100	10 00
Noon, John J.	38	100	10 00
Noon, John J.	39	100	10 00
Noon, John J.	40	100	10 00
Noon, John J.	41	100	10 00
Westfall, N. H.	45	250	25 00
Westfall, N. H.	46	250	25 00
Westfall, N. H.	47	250	25 00
Westfall, N. H.	48	250	25 00
Westfall, N. H.	49	250	25 00
Westfall, N. H.	50	200	20 00
Westfall, N. H.	51	200	20 00
Westfall, N. H.	52	100	10 00
Westfall, N. H.	53	100	10 00
Westfall, N. H.	54	100	10 00
Westfall, N. H.	55	100	10 00
Westfall, N. H.	(not issued)	2300	230 00
Willey, J. M.	58	100	10 00
Willey, J. M.	59	100	10 00

Carelessness.

It has become so very common to hear of accidents from the reckless use of firearms, that it is but fair to conclude from their great increase in numbers, that either we are growing more careless or else guns are more plentiful. While there can be no doubt that the latter, when accompanied by the low price and poor quality of the article, has much to do with it, yet it does not excuse the many accidents which happen through worse than carelessness, and for which the usual plea is, "I didn't know it was loaded." It has several times been proposed to make it a criminal offense to point a gun (loaded or not,) at another. This would be of very little use in making us more careful, for in most cases the offense occurs when it would not be punished. Under the head of "making excuses," the *Scientific American* uses this somewhat harsh, but nevertheless true language:

"Our statute and other laws distinguish between murder committed with premeditation and malice, from that committed without forethought. The insane escape punishment for crime, however heinous. The man who shoots his sister by accident is at once acquitted. But does the bullet discharged by accident prove less fatal than it would had murder been intended? The severed artery, the pierced lung, the congested brain, listen to no excuses. To him that is murdered it is all one whether it was premeditated or not."

The American Workingman.

The following is an extract from the first speech delivered in Congress by Hon. D. J. Morrell, President of the Cambria iron company. It has the true ring:

The American workingman must live in a house, not a hut; he must wear decent clothes, and eat wholesome and nourishing food. He is an integral part of the municipality, the State and the nation; subject to no fetters of class or caste; neither pauper, nor peasant, nor serf, but a free American citizen. He has the ballot, and if it were possible it would be dangerous to degrade him. The country stands pledged to give him education, political power, and a higher form of life than foreign nations accord their laborers, and he must be sustained by higher rates of wages than those of Europe. Our industries operated by American citizens must be freed from foreign interference and organized into a distinct American system, which will exact some temporary sacrifices, but result in general prosperity and true national independence. In maintaining diversified industries we utilize every talent, provide a field for every capacity, and bind together the whole people in mutual dependence and support, assuring the strength and security of our republic.

LOWER CALIFORNIA MINES.—The mines of Lower California are very rich, although but little is generally known concerning the wealth of that section of the country. The mountains which contain such inexhaustible sources of wealth are supposed to be a continuation of the same ranges as that of the Sierra Nevada. Most of the miners of Lower California are Mexicans. The ore is conveyed from the mines to the mills on pack mules, a distance of from 10 to 12 miles. The bullion is shipped to La Paz by wagon, and thence by schooner to San Francisco. There is a large number of mines in that section which could be worked with profit, but, through the arbitrary measures of the Mexican government, but little in the way of developing is accomplished. The country is suffering for lack of American brains and capital. With mineral resources unsurpassed, inexhaustible beds of salt, immense deposits of guano, a fine climate, to say nothing of its proximity to the Gulf of California, where almost every description of fish is abundant, the country is permitted to remain in an unproductive state year after year, and our people know almost as little about it as they do about the central deserts of Africa. Enterprising merchants and farmers would find a splendid field there for the exercise of their genius and energy, and it is hoped that the day is not far distant that will witness the annexation of Mexico to the American Union.

MENDING RUBBER BOOTS.—A great many directions have been published for mending india rubber boots and shoes, most of which were worthless. The *Scientific American* says that the following can be relied on: Procure a small tin box of prepared india rubber in a semi liquid condition, which can be purchased for a few cents at almost any store where india rubber goods are kept for sale. The boot must be washed clean and dried. Then the surface around the rent is to be roughened a little with the point of a knife, after which the semi-liquid rubber is spread on with a spoon as thickly as it could be without flowing away. Then a neat patch is prepared and covered with one or two coats of rubber. When the prepared rubber is almost dry, the patch is applied and held on firmly for a few minutes.

INTELLIGENCE has just reached us that a rich and extensive strike has been made in the third level of the Paymaster mine, at Ward district. We understand that it is the first ore found in that particular locality of the mine.—*White Pine News.*

VERY severe weather has been experienced in the Cassiar gold fields. Mules suffered terribly, owing to lack of fodder, and had to be fed on bread to sustain life.

The Simplest, Cheapest, Most Effective and Durable

Power Drill is the New

"CALIFORNIA" ROCK DRILL,

MANUFACTURED BY

HAWKINS & CANTRELL, San Francisco, Cal.,

AND SPECIALLY DESIGNED TO MEET THE REQUIREMENTS OF MINERS ON THE PACIFIC COAST

— ALSO —

AIR COMPRESSORS,

And Complete Mining Outfits for Power Drills.

Address,

L. W. COE,

Cor. Sansome and Sacramento Sts., San Francisco.

GIANT POWDER.

Patented May 26, 1868.

THE ONLY SAFE BLASTING POWDER IN USE.

GIANT POWDER, NO. 1,

For hard and wet Rock, Iron, Copper, etc., and Submarine Blasting.

GIANT POWDER, NO. 2,

For medium and seamy Rock, Lime, Marble, Sulphur, Coal, Pipe Clay and Gravel Bank Blasting, Wood, etc.

Its EXCLUSIVE use saves from 30 to 60 per cent. in expenses, besides doing the work in half the time required for black powder.

The only Blasting Powder used in Europe and the Eastern States.

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BANDMANN, NIELSEN & CO.,

General Agents, No. 210 Front Street.

Iron and Machine Works.

THE RISDON

Iron and Locomotive Works,

INCORPORATED.....APRIL 30, 1868.
CAPITAL.....\$1,000,000.

LOCATION OF WORKS:

Corner of Beale and Howard Streets,
SAN FRANCISCO.

Manufacturers of Steam Engines, Quartz and Flour Mill Machinery, Steam Boilers (Marine, Locomotive and Stationary), Marine Engines (High and Low Pressure). All kinds of light and heavy Castings at lowest prices. Cams and Tappets, with chilled faces, guaranteed 40 per cent. more durable than ordinary iron.

Directors:

Joseph Moore, Jesse Holladay, O. E. McLane,
Wm. Norris, Wm. H. Taylor, J. B. Haggin,
James D. Walker.WM. H. TAYLOR.....President
JOSEPH MOORE.....Vice-President and Superintendent
LEWIS R. MEAD.....Secretary
24v17-qy

WM. HAWKINS.

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MACHINE WORKS,

210 & 212 Beale St.,

Near Howard, - - - SAN FRANCISCO.

MANUFACTURERS OF

Steam Engines and all kinds of Mill
and Mining Machinery.Also manufacture and keep constantly on hand a
supply of our

Improved Portable Hoisting Engines,

From Ten (10) to Forty (40) Horse Power.

N. B.—Jobbing and Repairing done with Dispatch.

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Foundry and Iron Works.

HINCKLEY & CO.,

MANUFACTURERS OF

STEAM ENGINES,

Quartz, Flour and Saw Mills.

Hayes' Improved Steam Pump, Brodie's Improved Crusher, Mining Pumps, Amalgamators, and all kinds of Machinery.

N. E. corner of Tehama and Fremont streets, above Howard street, San Francisco. 3-47

STEAM ENGINES AND BOILERS

Of all sizes—from 2 to 60-Horse power. Also, Quartz Mills, Mining Pumps, Hoisting Machinery, Shafting, Iron Tanks, etc. For sale at the lowest prices by

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J. HENDY, No. 32 Fremont Street.

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MANUFACTURERS OF

IRON CASTINGS

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OF ALL KINDS.

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Rolling Mill Company,

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Established for the Manufacture of

RAILROAD AND OTHER IRON

Every Variety of Shafting,

Embracing ALL SIZES of

Steamboat Shafts, Cranks, Piston and Connecting Rods, Car and Locomotive

Axle and Frames.

— ALSO —

HAMMERED IRON

Of every description and size.

Orders addressed to PACIFIC ROLLING MILL COMPANY, P. O. box 2032, San Francisco, Cal., will receive prompt attention

The highest price paid for Scrap Iron.

SHEET IRON PIPE.

THE

Risdon Iron and Locomotive Works

Corner Howard and Beale Streets,

Are prepared to make SHEET IRON AND ASPHALTUM PIPE, of any size and for any pressure, and contract to lay the same where wanted, guaranteeing a perfect working pipe with the least amount of material. Standard sizes of railroad Car Wheels, with special patterns for Mining Cars. These small wheels are made of the best Car Wheel iron, properly chilled, and can be fitted up with the improved axle and box—introduced by this company, and guaranteed to outlast any other wheels made in this State.

All kinds of Machinery made and repaired.

24v22-3m JOSEPH MOORE, Superintendent.

California Machine Works,

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BIRCH, ARGALL & CO.,

Builders of QUARTZ, SAW AND FLOUR MILLS

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BOILER MAKERS

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Howard st., between Fremont and Beale, San Francisco

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LIGHT AND HEAVY CASTINGS

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FIRST STREET, - - - SAN FRANCISCO.

Geo. W. Fogg, Supt.

MACHINERY AND CASTINGS

OF EVERY DESCRIPTION.

Heavy Forging Boilers, Stationary
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KIND. SPECIAL ATTENTION GIVEN
TO MINING AND HOISTING
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Sole Manufacturers and Agents of

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GODDARD & CO., Proprietors.

OCCIDENTAL FOUNDRY,

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STEIGER & KERR,

IRON FOUNDERS.

Quicksilver Condensers and Furnace Castings.

Sole manufacturers of the Hepburn Roller Pan
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Screenings.Notice.—Particular attention paid to making Superior
Shoes and Dies.

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MANUFACTURERS OF

STEAM ENGINES, BOILERS,

CROSS' PATENT BOILER FEEDER AND SEDIMENT
COLLECTORDunbar's Patent Self-Adjusting Steam Piston
PACKING, for new and old Cylinders.

And all kinds of Mining Machinery.

Front Street, between N and O streets,
SACRAMENTO CITY.

Empire Foundry,

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RICHARD SAVAGE, Proprietor.

Heavy and light Castings of every description. House
Fronts, Mining and General Machinery estimated and constructed at shortest notice. On hand the celebrated Occident and French Ranges, Burial Caskets, Grates and Fenders, Road-Scrapers, Hydrants, Tugger Irons, Ploughwork, Sash Weights, Ventilators, Dumb Bells, Gipsies, Ship Castings, SOIL PIPE of all sizes, Fittings and Chandler Kettles in stock at Eastern rates. SHOES and DIES a specialty. Ornamental Fences in large variety. 4v30-177.

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MANUFACTURERS

OF ALL KINDS OF CAR WORK,

Machins Bolts, Bridge Bolts and Ship or
Band Bolts.

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CALIFORNIA BRASS FOUNDRY,

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ALL KINDS OF Brass, Composition, Zinc, and Babbitt Metal Castings, Brass Ship Work of all kinds, Spikes, Sheath Nails, Rudder Braces, Hinges, Ship and Steamboat Belts and Gongs of superlative. All kinds of Cocks and Valves, Hydraulic Pipes and Nozzles, and Brass Couplings and Connections of all sizes and patterns, furnished with dispatch. PRICES MODERATE. J. H. WEED. V. KINGWELL.

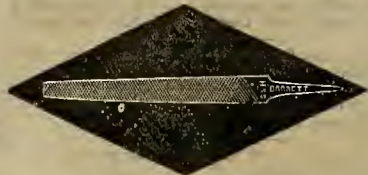
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Machinery and Castings of all kinds.

BLACK DIAMOND FILE WORKS.



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Manufacturers of Files of every Description

Nos. 39, 41 and 43 Richmond street,

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Sold by all the principal hardware stores on the
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Established 1856.

We have just added a large amount of new machinery of the latest and most improved kind, and are again prepared to fill orders for Rope of any special lengths and sizes. Constantly on hand a large stock of Manila Rope, all sizes; Tarrad Manila Rope; Hay Rope; Whale Line, etc., etc.

TUBBS & CO.,

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GOLD MEDAL

AWARDED TO

San Francisco Steam Pumps.



AFTER ONE OF THE

MOST THOROUGH TRIALS

Ever Had in the United States,

BETWEEN COMPETITORS

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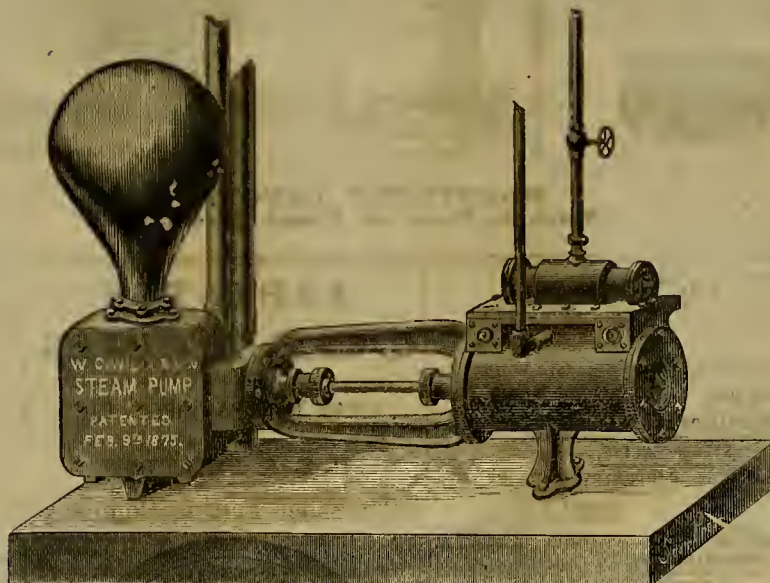
Best Established Reputation,

In which, at great expense, the different Steam Pumps were tried under every test known to experts, the Examining Committee of the Tenth Industrial Fair of the Mechanics' Institute have awarded to us their

GOLD MEDAL

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Best Steam Pumps on Exhibition.



We are prepared to furnish PUMPS UNDER CONTRACT, guaranteeing their ability to perform any specific work for which steam pumps are adaptable, such as

RAISING WATER FROM MINES,

FOR WATER WORKS,

FEEDING BOILERS, RAISING WATER FROM WELLS; STEAMER AND SHIP PUMPS, ETC.

We would also call the attention of those interested, to our Direct Acting Deep-Well Pumps for raising water from

Any Desired Depth.

Also to our Especial Construction of Pumps FOR HANDLING QUICKSILVER or heavy liquids.

We claim that our Pumps are the best ever made in simplicity of construction, economical use of power, durability and perfect adaptability for general uses, and we ask all persons interested to investigate our title to this claim. Salesrooms at our Machine Shop, 114 and 116 BEALE STREET, SAN FRANCISCO.

W. C. WILCOX & CO., Proprietors.

PACIFIC MACHINERY DEPOT,

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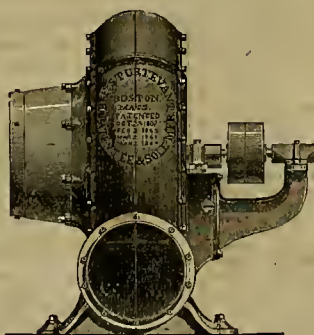
SOLE AGENT FOR THE PACIFIC COAST FOR

J. A. Fay & Co's Wood-working Machinery,

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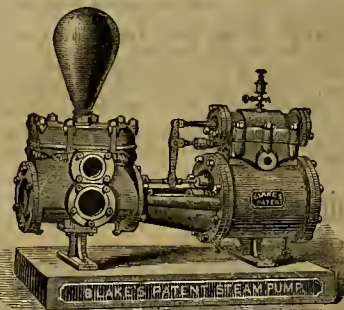
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BLAKE'S PATENT STEAM PUMP



Over 8,500 in Successful Use in the United States.

TULLOCH'S AUTOMATIC ORE FEEDERS

Increase the Capacity of each Battery Two to Three Tons per day.

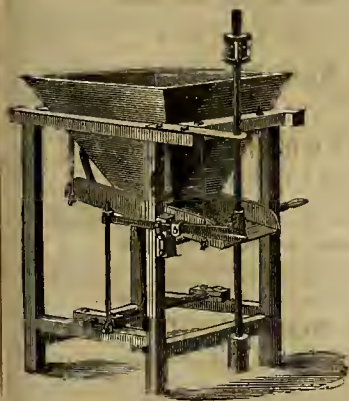
SAVE LABOR! SAVE MORE GOLD!
SAVE SHOES AND DIES.

One Man Can Attend to a Hundred Stamps.

WILL FEED ANY KIND OF ORE,
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ARE DIRECT ACTING. EACH MOTION SCRAPES A PORTION OF THE ORE INTO THE BATTERY, CAN REGULATE THE FEED. ARE SIMPLE AND DURABLE. ARE IN USE IN CALIFORNIA, NEVADA, IDAHO AND MEXICO. WARRANTED TO WORK.

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417 Market Street, S. F.



The HARRISON Burr Stone MILLS. \$1000 CASH Offered for their EQUAL. Will grind any thing. Send stamp for new Illustrated Catalogue. Just issued.

PRICES
60 percent less than any other mill in market.
540 bush. corn ground in 10 hours in 150 mill weight 300 lbs.
Manufactured by Harrison Burr Stone Mills, Ct.

G. W. & C. A. LANE, Exeter, N. H., write, Dec. 13:

"We started the heavy 20-inch Corn Mill last Friday you sent to Baldwin & Tabor, Manchester, N. H. We ran it most all day, and ground 60 bushels corn per hour. The mill you sent us at Haverhill, Mass., for A. S. Hook, is doing wonderfully. It is grinding on an average 2,500 lbs. good meal per hour, and has ground 2,800 lbs. in an hour. It is driven by an engine with a 9-in. cylinder, and takes the place of a 30 in. mill of another kind that, when doing its best and loading the engine with all it could carry, only ground 1,500 lbs. per hour. If there is a mill built that can beat that we would be pleased to see it brought out."

SAN FRANCISCO
Pioneer Screen Works,
Removed to 32 Fremont Street, near Market.

J. W. QUICK.
Manufacturer of perforated sheet metals of every description, at reduced rates. Mill owners using Battery Screens extensively, can contract for large supplies at favorable rates. This is the only establishment on the Coast devoted exclusively to the manufacture of Screens.

SCREENS

Mining Superintendent.

E. B. Smith, for nearly twenty years engaged in the direction of mines and mining enterprises, can be engaged to take charge of any legitimate mining enterprise. Mr. Smith thoroughly understands the "Sonora" process of chlorination and lixiviation, being the originator of the same, and the erection of all machinery and furnaces for the treatment of rebellious ores. Office—439 Bush street, S. F.

MINERS write for your paper.

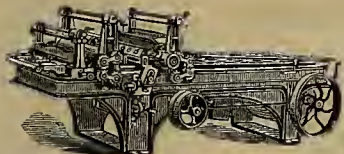
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No Agents are authorized to receive subscriptions for this paper at less than our advertised rates.

California Planers and Matchers, and Wood Working Machinery of all Kinds

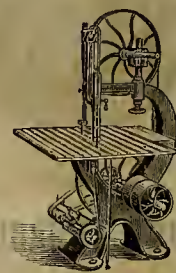
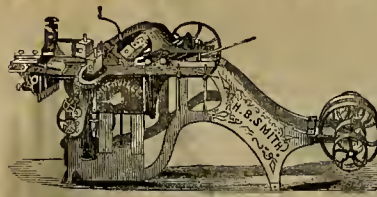
California Planer and Matcher

Is gotten up from new patterns specially for this Coast. It has Cast Steel Slotted Cylinder Head, running in patent self-oiling boxes; will plane 24 inch wide and six inch thick, and tongue and groove 14 inch wide. Will make rustic and stick gutters, or heavy mouldings, etc., and is the best job machine ever built. We have always on hand these machines with or without under cutter head, also, a large assortment of Planing Mill Machinery.



Smith's Celebrated Molders.

We have four sizes of these Machines always on hand—"B," "C," "D" and "E,"—to work either three or four sides. Have slotted heads and all other improvements, and may be seen in any mill on the Coast. **Prices reduced to 15 per cent. less than Eastern list.** We have also, a large stock of all kinds of Planing Mill Machinery, such as Molders, Mortisers, Tenoners, Band and Jig Saws, etc. Send for our new illustrated Catalogue. TREADWELL & CO.



Patent Band and Jig Saw

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SAN FRANCISCO, SATURDAY, MARCH 4, 1876.

VOLUME XXXII
Number 10.

The Bonanza Mines.

The Comstock lode still continues unremittingly to pour forth its treasure. The Consolidated Virginia mine yielded for the month of February, up to the 23d ult., \$1,700,001.95, an excess of \$746,000 over the yield of the previous month for the same time. The close of the fiscal month occurs on the fifth of each month, so the yield will not fall short of \$3,000,000 for the month of February. The Occident mill, which was unavailable for crushing in the early part of the winter, began crushing ore from this mine last week. The California stamp mill is crushing its 300 tons of ore per day, while the pan mill is working with the utmost perfection. Sluices for carrying the slimes to the old Gould & Curry reservoirs, in Six-mile canon, have been erected, so that nothing whatever shall be lost. The mine paid its usual dividend of \$10 per share last month, equal in the aggregate to \$1,080,000.

In the California mine work is going ahead successfully with rich ore on all hands. The mine is expected to announce \$3 dividends in May. The north drift of the mine on the 1550-foot level is steadily advancing to the northward, the face still in ore of a very rich character. The winze being sunk in cross-cut No. 6 on the 1500 foot level, to connect with this north drift, is down 28 feet, the bottom also in very rich ore. Work has been resumed in the main north drift on the 1500-foot level, that drift having been stopped since the conflagration last October; it will now be pushed ahead until it connects with the Ophir mine on the level. As soon as this connection is made, and ventilation obtained, cross-cutting and developing that portion of the mine will be resumed. Sinking the C. & C. shaft is going steadily ahead.

The Belcher ore breasts are yielding finely, especially those opened on the new ore body on the 1200-foot level. The yield is 450 tons of ore per day. The Gold Hill News says the mills are all kept steadily running, and the ore proving rich in gold, the average value of the bullion being over two-thirds gold to one-third silver. The bottom of the winze being sunk from the 1500-foot level downward, is developing better ore than was expected, and the prospects of that portion of the mine are growing daily better for the development of a fine body of paying ore. The grading for the new and powerful pumping machinery at the air shaft will be completed in five or six days more, when laying the foundations will be commenced.

The Ophir is yielding 200 tons of ore per day, and the ore breasts are looking and yielding finely. Three mills are now running on ore from this mine. The new ore discovery in the face of the east drift on the 1600-foot level, north of the old workings, is opening up splendidly, and promises a very important development. The upraise in the east ore body from the 1300-foot level, running to connect with the east drift on the 1100-foot level for air purposes, is in rich ore. This is also a very important feature, as this ore lies nearly 500 feet east of the shaft, and entirely east of all the former prospecting done in that portion of the mine.

The latest report from the Fort Lane diggings in Jackson county, Oregon, are more conclusive as to their richness than ever. James McDougal, a miner engaged in ground sluicing there, took out a nugget the other day worth \$400, and several other very valuable specimens have been found. The only drawback to working the mines at present is the scarcity of water; but arrangements are being made to obviate this difficulty.

A MINER in the Silver Hill mine fell down a shaft, a distance of 110 feet, the other day, but though somewhat bruised and cut about the head, he worked out the remainder of his shift before having his wounds dressed, and is now all right again.

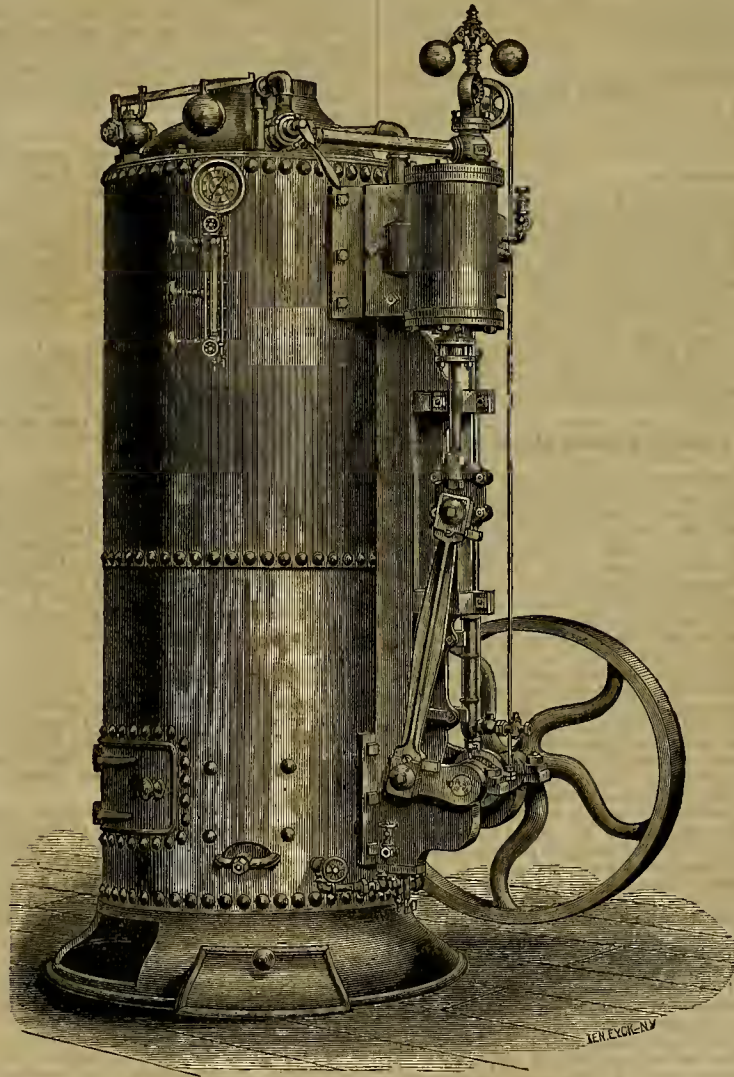
The railroad troubles in Santa Cruz county have been compromised, and the narrow gauge is to pass through Watsonville, which it was designed to leave at one side.

The Bigelow Engine.

We give herewith an illustration of the Bigelow portable engine, which is in use extensively in the Eastern States, but which is now introduced on this coast for the first time. Messrs. Neylan & Young, 18 and 20 Spear street, agents, expect the first engine of this class to arrive in a few days. It is claimed to be the cheapest portable engine on the market, and is made in sizes from four to 15 horse-power. Bigelow

engine and boiler is furnished a cast iron base and smoke bonnet; Judson's patent governor; pump; steam gauge; glass water gauge; three try cocks; safety, stop and check valves; blow off cock; steam, exhaust and feed water pipes; chain and air cocks; one set of grate bars; in fact, everything complete, ready for running, except the smoke stack.

The boilers are made after the most approved plan, from Pennsylvania charcoal, No. 1, and best flange iron. The tubes on the boilers are first-class. A great many of these engines are in use in the Southern States, where they are great favorites. As before stated, the specialty



THE BIGELOW PORTABLE ENGINE AND BOILER.

& Co., of New Haven, Conn., the manufacturers, who have been makers of boilers and engines for many years, say that they were, by many inquiries for a low-priced portable engine, led to see if they could not reduce the cost, and were surprised at the amount of the cost of the bright and finished work on these engines, where, for all practical purposes, paint was just as good.

This led them to produce and offer to the public an engine of perfect workmanship, but one in which customers were not compelled to pay for bright and finished work when they did not want it. The Bigelow portable engines are made in large quantities, fifty at a time, and by proper tools and machinery, the manufacturers were enabled to systematize their work and produce a good engine for a low price. They use a cast steel connecting rod and metallic piston rings. With each combined

claimed for this engine by the manufacturers is that it is not only cheap but good.

The Livermore coal mining company have lately taken steps to secure the right of way for a railroad from their mine to Livermore, to connect with the Central Pacific, whereby cars loaded with coal may be transported direct to Oakland, San Francisco and San Jose without unloading.

The Virginia Enterprise says: "There are many more workmen in this town than can find work. All of our benevolent societies are taxed to their utmost to afford assistance to men who have arrived here without money."

A survey is soon to be made for a new wagon road to connect Downieville and Nevada City.

"STOVE-LID CURRENCY" is the name for trade dollars in Eureka.

The Fryer Process.

Although the details of operation of the Fryer process are as yet unknown to the general public, and there is considerable grumbling that the secret should be kept so long, there is still great interest manifested in it. Criticisms, both adverse and favorable, are freely indulged in, of course, but any authentic decision must be delayed until the *modus operandi* is known. The proprietors naturally do not expect the mining community to pronounce favorably upon any process which they do not understand and which they are not permitted to see tested practically. Although the Fryer works at Grass Valley have been in operation for some time, and many samples of rock from different localities have been tested to the satisfaction of the parties interested, it is no proof to those who only know these matters by hearsay, that success has been attained.

We, in common with the mining community, are somewhat impatient that the veil should be lifted, although we are assured that the delay will inure to the benefit of the mining interest. We are authorized to state that at no distant day the works will be opened for inspection, and a number of the representatives of the press and mining men will be invited to attend and examine the works and method of operation. We shall, as soon as possible, give illustrations of the machinery in use, and a description of the whole process. We are informed, on good authority, that in the delay that has occurred, while the process has not been changed in any principle and work has not been stopped, many important improvements have been inaugurated, having in view the saving of time and money. The works are now running day and night. Mr. Fryer is aiming at perfection in his process, and is certain that it can be manipulated as cheap as any first-class mill in the State, running by steam power. Like the mill system it is continuous. We shall keep our readers duly posted on anything which may occur of interest on this subject.

Since the above was in type we have received a communication from Mr. Fryer, which we give in another column. It will repay perusal. In his letter, Mr. Fryer asks every one to withhold criticism until after the whole case is made public.

"CRAWLING GROUND."—The Calaveras Chronicle says: Operations are being prosecuted with indomitable energy in Veith's gigantic hydraulic in Tunnel ridge. For some time past work has been confined to running off top dirt, the whole hill, for several hundred yards back from the face of the claim, comprising four or five acres, having slid in. From the surface down to a depth varying from 20 to 50 feet, the soil is a mixture of gravel and clay, resting on a hard pan underneath. The heavy rains of the winter, together with the hydraulic operations at the base of the ridge, have loosened the surface, and it is gradually gravitating towards the gulch below, slipping over its solid gravel foundation. The surface is thickly studded with tress, which the sliding process has tilted into every possible position except the perpendicular. In fact, the whole thing looks like the debris of an Alpine avalanche. We are informed that the hill frequently "crawls" 12 feet during the night, and that it has required incessant labor and the employment of several powerful hydraulics to prevent the burying of the mine altogether. Not much further trouble from the slide is apprehended, however, and an opportunity for piping out the bottom and "cleaning up," will soon be afforded.

JOHN DIX, who for the past two years has been working what is known as the Dayton claim, about two miles above the forks of Butte creek, picked up a nugget last week weighing 48½ ounces, and valued at between \$800 and \$900.

The production of gulch gold on Aod below Spanish Bar, Clear Creek county, Colorado, amounted to \$80,000 last year, showing an increase of over \$30,000 on the figures of 1874. Ten claims were worked, two of which were exceptionally rich.

MISCELLANEOUS.

Thoughts on "The Mission of the Press."

[From Pacific Rural Press.]

Editors Press:—When the rain pours day and night for weeks, days and hours, daily existence becomes monotonous. We have read and reread the last few numbers of the *Rural*, the *Call*, and our county contributions to current literature, until our head seems full of notions, worse and more confounded than a Yankee curiosity shop.

From reading we take the pen; from receiving the thoughts of others we feel as if we should also give out thoughts, so as to be a giver as well as a receiver. A thought born of the mind is buried there, except we give that thought entrance in some shape. When recorded by the pen, that thought becomes a fact, but when it has been transcribed by the printing press it almost becomes immortal, and goes out to fulfill a mission either for good or evil. Many a thought finds a prominent place in the world's record book which the writer would fain recall; but once on its mission no regret can wash out the stain. This reflection sometimes may withhold thoughts which otherwise might find expression, making us careful that no heart will be saddened by their effects, no eyes dimmed by being uncharitable, no pathway pointed out wherein the unwary might go astray, no desire to expose the frail side of human experience, but a wish to instruct and elevate, to cultivate Hope and Charity—white-winged angels of peace and purity.

Too often the daily press of cities panders to a depraved appetite, exposing the weak side of human nature, sinking still deeper the victim of fate into the maelstrom of hopeless despair. Suppose, for effect, that the city press should stay the recital of society's noisier sores, even for one day, and herald forth all the good apparent in human life and action. The rebound would convulse social life and private gossip. But how much better would it be for the peace and innocence of the inexperienced if these filthy details of every day weaknesses were altogether suppressed, and only the good deeds of men and maidens made public. The mind grows on what it feeds upon, and these scandal dishes served up by the public's great oracle—the press—keeps society in the van of all that depraves human nature.

It is a relief to turn to the Home Circle of the *Rural*, where morality, practical religion and virtue stand pre-eminent. Rural life is displayed in its simplest, holiest guise, health ennobled by strict temperance, and a walk with nature and divine laws; making work, worship and enjoyment, praise.

This Centennial year should inaugurate a higher standard of literature among the so powerfully influential daily papers of the metropolis; covering up with a mantle of charity the faults and failings of "brothers and sisters," and holding up for emulation the good deeds of the good Samaritan, or even those accounted as sinners. The reading mind would not then be polluted by exaggerated closets skeletons, or the actions of weak mortal nature.

Messrs. Editors, you will excuse my lengthy remarks on this all important theme; but if every reader had the same unsatisfactory reflections as myself after reading the pages of our public dallies, the necessity for such a scandal dish would soon pass away. How glad we feel at the recital of some noble act; some deed of heroic valor; some sentiment appealing to the better and higher instincts of the soul. If this teaching were more universally practiced how soon would the evils complained of pass away, and a spirit of emulation be cultivated for a higher good? We would allow the stricken and the sinning to suffer in secret without the anguish of knowing that thousands of readers were gloating over a magnified dish of the heart's burden, crushing many good and noble natures into the grave of the envious. May a warm fraternal and paternal spirit animate the pen of the votaries of the press, is the desire of yours in transitu.

JOHN TAYLOR.

Mount Pleasant, Feb. 11th, 1876.

Jersey Mining District.

A correspondent of the *Silver State* says: The Jersey mines are situated about 60 miles south of Winnemucca, with a good natural road the whole distance, and good feed and water the entire route, and if your townspeople make half the effort that ought to be made for the trade, nothing can keep Winnemucca from controlling it. It is the county seat, and as a natural consequence, communication will be established by mail between the two places; but Battle Mountain is making a big effort to command the prize. Fortunately the hill passed for the division of this county three years ago did not include this district.

The Jersey mine was discovered in May, 1874, by the present foreman, Land Tremble, and has paid its way ever since, and shows that prospecting will pay if followed up, as at the time of its discovery Tremble was heavily in debt, and at the time of its sale to the present company he was as much ahead. Since the sale, 30 days ago, the company have built

a furnace with a capacity of 45 tons per day; cut a grade from the furnace to the mine, three-fourths of a mile long, at big expense; built offices, laid out a town, sold a great many lots at prices ranging from \$100 to \$500, burnt coal, bought and paid for eight large teams, and have engaged all the hay and grain in Pleasant valley at liberal prices. The mine is at the present time prospecting to a considerable extent. The north tunnel is in a depth of 300 feet; the south tunnel a distance of 80 feet; the incline is down from the tunnel level 100 feet, and from the surface to the bottom of the shaft the distance is 300 feet. The ledge is from two to 12 feet wide, and at no place are there any barren spots, so far as yet prospected. J. Sevenoake is superintendent of the works, and a more persevering, energetic man cannot be found on the coast to-day.

White Pine Mines.

The White Pine News of the 19th says: We are indebted to Deputy Assessor Comins for the following information in regard to the product of the mines of White Pine county during the last four years, as taken from the Assessor's books:

Quarters Ending	
March 31, 1872.....	\$234,439 33
June 30, 1872.....	133,454 47
September 30, 1872.....	261,806 00
December 31, 1872.....	108,798 28
Total for 1872.....	\$738,498 08

Quarters Ending	
March 31, 1873.....	\$ 38,425 35
June 30, 1873.....	178,832 09
September 30, 1873.....	165,737 00
December 31, 1873.....	112,802 50
Total for 1873.....	\$495,796 95

Quarters Ending	
March 31, 1874.....	\$ 49,688 77
June 30, 1874.....	124,137 10
September 30, 1874.....	203,013 79
December 31, 1874.....	223,001 97
Total for 1874.....	\$599,841 63

Quarters Ending	
March 31, 1875.....	\$ 96,690 25
June 30, 1875.....	284,876 77
September 30, 1875.....	218,304 40
December 31, 1875.....	265,968 54
Total for 1875.....	\$865,839 96

The Eberhardt & Aurora company's mines produce the largest amount of ore, and for two years, 1873-4, these mines were lying idle, which accounts in a great measure for the smallness of the returns during these years. In 1875 their mill only ran nine months. From present indications, we judge that the yield this year will double any for the past four years. The outlook for this county was never more promising than at the present time. However, for a camp that attracts no more attention than this, \$2,697,026.52, in four years, is not bad.

An Expert's Estimate of the Bonanza.

The following letter was written to one of the leading stock operators by Robert Barton, a mining expert of great ability and experience:

DEAR SIR:—We arrived here on the morning of the 2d, and aside from my business, are having a very pleasant time. My visit through the Consolidated Virginia and California yesterday and to-day has been most interesting and satisfactory, for Mr. Fair seems to exert himself to have me see everything of interest in these two mines. He has done marvels in the way of reconstructing such elegant and substantial works in so short a time since the fire, and you cannot give him any too much credit for this and the skill and good judgment displayed in the development of these two mines. As far as Consolidated Virginia and California are concerned, of course I look for big showings, but I find the 1500 and 1550 levels—"and especially the latter"—simply marvelous in quality and quantity of the ore. That Consolidated Virginia alone can be made to produce 1000 tons of ore a day for at least five years to come, counting on nothing not yet developed below the 1700 level, there cannot be the least doubt; and this ore will mill at an average of about \$150 per ton for all the ore in eight above the 1500 level, and from that up to \$300 per ton for all the ore between the 1500 and 1700 levels. The 1550 level is opening up a perfect sea of the richest kind of ore, but I think the next 100 feet deeper will beat even this, for no doubt the full width or rounding of the ore body will be about the depth of 1600 feet, and right here let me state that I would give the Consolidated Virginia company \$400 per ton of ore for a picked section below the 1550 level, say 200 feet long, 100 feet deep and 60 feet wide, making close on to \$40,000,000 for the section, and at that my chances would be good in pocketing as much myself. I would also say that very few people probably realize the immensity of this mountain of ore, taking only what is in sight in Consolidated Virginia alone, when you tell them that it is not less than 400 feet in length, 300 feet in depth and 250 feet in width, saying nothing of what is in perspective in the South Consolidated Virginia ground "yet undeveloped," and below the 1700-foot level. It would be about the size of one of our San Francisco six 50-vara blocks, standing up in the air 300 feet high. Thus you can readily see that the ore so far worked out of Consolidated Virginia below the 1400-foot level has made but a small impression on this block of ore, and the section above referred to at \$40,000,000, "though perhaps the cream of the ore body,"

would make but a small hole in such a large mass. As far as Consolidated Virginia and California are at present developed I cannot see any material difference in their values. But whatever it may prove to be I am confident Consolidated Virginia will have the best of it in depth, having my own reasons to think that the ore will work its way south, but of course this is a matter of conjecture. On close inspection into adjoining ground, I should be able to express a decided opinion as to its prospects; but remembering quite well the old developments of the North Potosi, during Bonner's time at the Gould & Curry and Savage, I think an ore body should exist in the North Savage and South Gould & Curry, and possibly this body of water just tapped may lead to something of this kind. Savage ought at once to have similar pumping machinery to that of the C. & C. shaft, and it ought not to take over sixty days to place it ready for work.

I have no desire to look into the other mines here at present after what I have just seen, and if you come across any wise and doubting Thomases who cannot see it in this light, I am sure they can look for themselves, which is the next best thing. I will promise them the greatest treat they ever had. Respectfully,

ROBERT BARTON.

Virginia, Nov., Feb. 4th, 1876.

A Bird Hatched out from an Artificial Egg [?]

The *Allgemeine Zeitung* makes the announcement that Prof. Geifling, of Brunsberg, Germany, a gentleman somewhat known to the scientific world as a clever chemist, has of late been turning his attention to the artificial production of the egg, and after innumerable experiments, during a period of ten years, he succeeded in the mysterious combination of the elements so as to form a compound similar to the natural article.

Encouraged by this success, the doctor set about his almost hopeless task with a determination to surmount every obstacle. He felt satisfied that it was only by means of galvanism that his object could be accomplished, and of a battery of constant, equal and moderate power.

After trying various kinds of batteries he by accident learned that a constant battery of moderate power had been constructed in England by placing a plate of zinc and a plate of copper in an ordinary flower pot, and keeping the earth moistened with ammonia.

He immediately constructed such a one, and after various modifications, succeeded in adapting it to his purpose; and had the satisfaction of seeing his labor crowned with success, and reducing from elements a substance similar in all respects to an egg.

Now came the exciting period of his labors, to see whether this artificially formed egg could be hatched by heat. He placed it in his hatching oven, and watched it through a glass door almost constantly, scarcely taking time to eat or sleep, until he had seen the success of his grand experiment.

Day after day he watched with patient assiduity the consummation of his darling scheme, and at last had the satisfaction of witnessing the consummation of his hopes. On the 20th day, a small hole was observed in one side of it, and shortly after the bill of a bird was thrust through, and next morning he had the satisfaction of finding in the receiver a live bird, of some unknown species, perfect in its anatomy, but, strange to say, entirely without feathers!

"This most astonishing result," remarks the paper from which we quote, "has almost upset our previous notions of natural philosophy and the governing laws of animal organism. As we gaze upon the featherless bird hopping about and feeding upon the seeds given it, we begin to doubt the reality of our own existence, or that of anything about us!"

"The professor, urged on by his success, has set about another analysis, and has no doubt of being able to produce perfect birds of every known species."

The *Allgemeine Zeitung* of the next day remarks that the whole city is electrified with the development. A very pretty hoax, which will no doubt deceive many for the time being.

WESTERN HUMBOLDT.—A correspondent of the *Silver State*, writing from Rye Patch, says: The sunshine of prosperity is again beginning to illuminate the visage of "ye honest miner," and this locality is filled with never tiring prospectors, whose countenances indicate the near approach of good times. The welcome hum of bustling industry is again to resound through the "hills of the Montezumas," and old Humboldt is preparing to take its place in the front rank of mineral producing counties. From every canon where the pick and drill are busy, good results are shown. The Rye Patch mine is looking better than ever before. The capacity of the mill will be increased, and the rattle of the stamps will sing in harmony with the rattle of the dollars it produces. Relief district will arouse from its sleep and play its part in forcing the "ragged edge currency" to the wall. The Oreana smelting works will puff and roar as it did before, and add its meter to the crest of the silver wave. In San Jacinto district the developments are flattering, and the ledges of chlorides and galena ores are as huge as the whisky rings of the incorruptibles. The copper mines of the east range are attracting considerable attention, and experts and their eye glasses are constantly occupied in searching nature's matrix for silver lining to their purses.

The Black Hills.

The Black hills mining excitement still continues, and is even on the increase as spring draws near. Parties of miners are leaving for the hills from all quarters. Among the people who are organizing mining expeditions into the interior are many substantial, well to do people in Iowa, Dakota and elsewhere, who are doing well enough on their lands, but who cannot resist the impulse to go further and seek a short road to fortune in the new gold fields. There are, as is usual in all such cases, large squads of roughs who are doing considerable personal damage among themselves as well as among the trains of people whose intentions are good. There is a crowd of thieves and murderers out in the hills who have been swinging their revolvers around pretty recklessly, and these the Marshal has been making the necessary arrangements to capture. A party of 157 men left Yankton last week for the hills, and over 100 miners left Sidney, Nebraska.

Advices by mail from Red Cloud, in the Black hills, from official sources, state that there is no truth in the report that Red Cloud intends to leave the agency with a part of his tribe, for the northern country, to fight the Crows. Neither is there any truth in the report of a fight among the Sioux about the white people going into the Black hills. The state of affairs at the agency remains, as it has for the past year, quiet. Retractions are being issued regularly, and there is no prospect of the slightest opposition on the part of the Indians to the occupation of the Black hills. On the contrary, other reports say the Indians will prevent any occupation of their reservations by miners. If the miners go there in violation of the Indian treaty it is hardly to be expected that the Government will protect them, and they will have to fight it out themselves.

Custer City and Hill City both have a population already of some 600 souls. Several other towns are growing up, and if gold is found in abundance, it is anticipated that, in spite of the absence of Government protection, there will be a pretty considerable rush to the hills in the spring. One man came to Chicago a week ago to purchase a sawmill, which he has taken out to that region, and as an indication of the prospects of a large emigration, it may be mentioned that a new stage line is about to start from Yankton to the Black hills.

Although we are not among those to advise miners here to go to the Black hills on any "wild goose chase," there are many who have no doubt made up their minds to go, and to them the following information, derived from Hon. J. H. Burdick, U. S. Marshal of Dakota Territory, by the Chicago *Inter-Ocean*, will be of interest:

The Dakota Southern railroad company, through their general superintendent, answer some inquiries in regard to the route of travel and rates of fare, which may be of some interest to parties contemplating a trip to that section. The Pierre route, says the superintendent, will be the choice of all. The first boat leaves Yankton, via this route, on April 10th. The fare from Yankton to Fort Pierre by boat is \$5, including berths in the state room, while meals are 40 cents extra. The stage fare from Fort Pierre to the hills is \$12.50, the distance being 100 miles, and the time occupied 24 hours; the time from Yankton to Fort Pierre is 36 hours by boat. These rates include 50 pounds of baggage to each passenger. Adding the railroad fare from Chicago to Yankton—\$17—this makes the cost of going to the Black hills from Chicago just \$34.50, and by this line there will be only 100 miles of staging.

A Cheyenne paper gives the distances from that place to Custer City, on French creek, in the Black hills, as follows, by the route taken by General Custer last summer, the shortest yet made.

	Miles.
Cheyenne to Fort Laramie.....	93
Fort Laramie to Rawhide.....	18
Rawhide to Running Water.....	24
Running Water to Old Woman's Fork.....	12
Down C. W. F. to Sage creek.....	24
Thence by right road to Cheyenne river.....	26
Cheyenne river to Custer City, via ridge road and Ruby Springs.....	49

Total distance.....	236
Custer City to Spring creek.....	8
Down Spring creek to Camp Crook or Stand-off Bar.....	10
Stand-off Bar to Rapid creek.....	12
Rapid creek to Box Elder.....	15

Aggregate.....280

The route to the gold fields of Big Horn country is from Cheyenne to Fort Laramie and Fetterman, to which latter post the distance is 165 miles, with good ranches all the way. The distance from Fort Fetterman to old Fort Reno is 104 miles; from thence to Kearney 65 miles, and thence to Fort C. F. Smith 90 miles.

TAKING CARE OF CARRIAGES.—A precaution relative to the care of carriage, which is often overlooked, is to prevent rust of the spring plates where they are joined together and not covered with paint. The joints should be lubricated; and the best material for this purpose, where dark colors are used in painting, is composed of two parts each of pure beef and mutton tallow to one part black lead, well mixed, applied warm and in small quantities. When light colors are used in painting, diminish the quantity of graphite.

A PRINTER from Nebraska is on his way to the Black hills, and will start a paper at Custer City within a fortnight.

MECHANICAL PROGRESS

A New Form of Iron Furnaces.

Some time last year Mr. Alexander Royer and Mr. Naylor filed a caveat for a new form of blast furnace, the distinctive improvement being in the oval or oblong shape given the hearth, inwall and tunnel head. To make an experiment with a new form of furnace is exceedingly costly, so much so that but few persons can be found with either the nerve or the enthusiasm to undertake it. Yet there is no branch of business so needful of improvements as the iron business, nor one in which the theories on which it is based fall so short of being carried out in practice, all from the above reason. However, Messrs. Royer and Naylor have received many words of encouragement from practical iron foundrymen who have examined their models and plans, and several pledged some thousands of dollars for the building of one in the vicinity of Ironton and Ashland.

They claim that the oblong shape of the hearth, inwall and tunnel head with a stack of the present height of charcoal furnaces will effect a saving of at least one-half the charcoal used in a circular stack, but that by the construction of a stack only 20 feet high, with the hosh 10 by six feet, with the blast applied as shown in their models, i. e., by at least two tuyeres on each side, not quite opposite, but with each tuyere facing midway of the unoccupied space, and with a filling place above each tuyere, that metal can be made with only one-third the charcoal now used, and that more of it can be produced in the same time than by the present circular stack. They also claim that the proposed stack will make a more regular quality of metal, as the burden can be changed every four hours, or blown out, instead of taking 12 or 15 hours as now in the circular stack.

The expense of construction of one of these stacks will be not half so much as of the high circular form and the saving of two-thirds of the charcoal will not necessitate the building of extensive hot blasts. It is expected that the mode of filling and the shape of the stack will more equally distribute the ore and the fuel, secure more perfect combustion and utilizing every particle of the fuel to the best advantage. In experiments on a small scale 30 pounds of charcoal has produced 100 pounds of metal, or at the rate of 681 pounds of fuel to the ton of 2,268 pounds of metal. In practice not less than 2,440 pounds for hot blast, and 3,391 pounds for cold blast, are required to the ton of metal, a vast difference indeed, and one indicating that the best results cannot be obtained from the present form of stack. If the present form of stack can do what is claimed for it then it is an improvement the importance of which cannot be estimated, and we should like to see the experiment tried.—Ironton Com.

New Fuels.

In the manufacture of briquettes, or brick of coal-dust, for fuel, a slight modification of the usual Belgian process is announced. Instead of using water in making the coal-dust into a paste, a boiling mixture of tar and pitch is employed. To this is added sulphate of lime to remove the ammonia of the tar. The mixture is composed of 33½ parts of pitch, 13.6 of tar, and 1.80 of sulphate of lime, to one ton of coal-dust. The experiments going on in this department of fuel economy in this country have reached a practical stage in Pennsylvania, and fuel manufactured from coal-slag is already being extensively employed. So far, the reports are favorable to the quality of these American briquettes, and they are being freely introduced on locomotive engines. A French company is now extensively manufacturing kindling material for domestic fires by utilizing corn-cobs. Two processes are employed. By one, the corn cobs are first steeped in hot water containing two per cent. of sulphuric acid, and then saturated with resinous matter. By the other process, the cobs are soaked in a hot mixture of 60 parts resin and 40 parts tar. They are then dried, and afterward baked on a plate heated to 212° Fahr. Assorted and encased in bundles, they sell at the rate of four for an English halfpenny, or, at wholesale, for \$2 or \$3 a thousand. A process for utilizing corn-cobs by saturating them with resin has been patented in this country, and their manufacture has been attempted. The inventor already reports an active demand for them as domestic fire-lighters.—Scribner.

CARRIAGE WHEELS AND WHAT THEY CAN CARRY.—According to Mr. Henry Richardson, of York, Eng., the weight which carriage wheels are calculated to bear is governed by the circumference of the spoke, measured at half-way in its length. A spoke whose circumference at half-way its length is 3 inches, will carry 9 cwt.; 3x3 equals 9. So of any other diameter. A spoke 2½x2½ equals 7½ expressed in centals. By this formula the weight which any carriage wheel is able to bear safely may be readily calculated. It is further computed that: "A four-wheeled wagon traveling at three to four miles per hour will carry the full square of the circumference of the spoke of its wheel in cwt., over and above its own weight; a cart half the square. A carriage traveling at from six to ten miles an hour will carry the square of its spokes in cwt. of carriage and load; a gig half this.

Motive Power from a Permanent Magnet?

Mr. W. W. Gray, of Huntingdon, Penn., claims to have discovered a mode of utilizing the permanent magnet as a motive power. He claims to do this by the use of a cut-off or interpose, which neutralizes or cuts off the magnetic attraction and which is made to rapidly interpose and withdraw from between the magnet and the object attracted, which "object" would correspond in its effects to the piston of an engine. It has for many years been a study with Mr. Gray to discover or devise some element or compound which would defy, and by interposition, cut off the attraction of the magnet; all else would be simple. This discovery he claims to have made, and the same is verified by the editor of the *Huntingdon Journal* as follows: "We have tested it [the cut-off] in every way that could be suggested. We have taken a small piece of steel, placed it on glass, and then placed a magnet weighing perhaps a pound within attracting distance, and instantly the steel would fly to the magnet. We have placed the cut-off over the poles of the magnet, and placed it within the thickness of a hair of the steel, and it would not manifest the least attraction or motion. A needle suspended by a thread would fly to the magnet at considerable distance, but the moment the interpose or cut-off was applied the magnet could be placed within the thickness of a thread without any visible attraction. We have seen a pump, worked by magnets alone, pump water by the hour. Any force required can be supplied—from an engine to run a delicate watch or sewing machine to a power sufficient to propel the largest steamer." According to the above Mr. Gray accomplishes with a permanent magnet, which furnishes its own power at no cost except that of its original manufacture, just what has heretofore been done with the electro-magnet at the great cost of a battery to keep up its power. In Mr. Gray's alleged invention his "cut-off" takes the place of the "battery." If he has accomplished what he claims to have done what becomes of the new doctrine of "the correlation of forces?"

Bessemer and Its Uses.

The success which is attending the attempts to substitute Bessemer for iron in many branches of manufacturing and construction, is full of promise for this industry. We have hardly done wondering at one achievement before we hear of another. Where the first rude and crude attempts to use it proved failures later experiments have proved successful. We have already informed our readers of the successful manufacture at Troy of horse shoes and nails from Bessemer. The shoes, it is claimed, are lighter and wear longer and more even than those of iron, while the cost is not much in excess of iron. The nails, it is asserted, can be driven through oak planks and clinched.

We were shown yesterday a piece of hoop rolled by Wm. Clark & Co., from a crop end of a rail made at the Edgar Thomson. The flanges were bent up and welded in the ordinary way and rolled into the hoop, the strength of which was something marvelous. After a bending back and forward for ten minutes without any effort, we concluded to postpone any further efforts. The same hoop was riveted twice and tested, and sheared the rivets each time, but on the third trial it broke out at the side. The rail ends can be furnished at the price of muck, and the hoops can be made one-third lighter and still be stronger.

There is also a prospect that the Poughkeepsie bridge will be built of Bessemer. It was a favorite idea of the late J. Edgar Thomson that railroad bridges, especially, could be made of this metal, and an attempt was made in one instance, at least, to build a bridge of it, but was not successful on account of too high a temper. Now, with the improvements that have been made, it is possible to get almost any per cent. of carbon, and the attempt will no doubt now be successful.

A number of the steel and iron manufacturers of this city are gradually getting to use more and more Bessemer. One steel manufacturer has just given an order for 12 tons of ingots. Another has been using them steadily for months. One manufacturer of railway supplies expects to use 1,000 tons next year. These are indications that the steel age is coming.—Am. Manufacturer.

NEW COPPER PAINT.—The Paris correspondent of *Silliman's Journal*, states that M. Audry, who has been so successful in electro-plating with copper the cast iron monumental fountains in the *Place de la Concorde*, makes his new copper paint from the porous copper deposited by the galvanic battery, mixed with a varnish. The solvent of his varnish is the light and refined petroleum, or what we call benzine. The copper is very pure and is easily pulverized, then it is mixed with the benzine varnish, and applied either to iron, brass, plaster or wood. When this copper is mixed with oils, it acquires a green, antique hue.

THE American Manufacturer suggests that "the fuel of the future in the varied manipulation of the rolling mill will undoubtedly be gas. The question awaiting solution is the form of furnace which will be used. For the present, at least, in old works, and especially where bituminous coal can be procured at a low figure, the cost of Siemens will stand in the way of its introduction. In such works the aim will be to get some method by which the old furnaces can be used with little or no alteration."

SCIENTIFIC PROGRESS.

Prof. Tyndall on "Germs."

Prof. Tyndall recently delivered a lecture at the annual opening of the Royal Institution at London, in which he pointed out some of the possible practical bearings of the new "Germ Theory," when viewed in relation to medical science. The basis of the Professor's experiments is that, in the course of searching for means of obtaining air free from floating motes, he found that if air is allowed to remain in a closed air-tight vessel covered inside with glycerine, in the course of three or four days it deposits all its motes, which adhere to the glycerine, and it thus becomes quite free from them. The test of its perfect freedom is to pass a powerful beam of light through the case, when, if any motes are still floating, they make known their presence by reflecting the light. With air thus purified, Prof. Tyndall had made a long series of experiments bearing on the question of spontaneous generation and on disease germs. From these experiments Prof. Tyndall argues that sewer gas of itself is harmless; it is the germs floating in the sewer gas that sow disease. If there are no disease germs present, the gas does no harm.

Another set of experiments on the horizontal and vertical distribution of motes led to the conclusion that life germs float in little clouds, since an immense number of tubes exposed in different parts and at different heights in the laboratory showed that some were affected many days before others. Clouds of disease germs may explain a puzzle to surgeons—why a wound going on well for a while should suddenly, and without apparent reason, become putrid. It may be that it is being dressed just at a time when a "germ cloud" is passing. In his concluding remarks, Prof. Tyndall referred to the fact that it has remained for modern science to discover that, more than by battle, or accident, or famine, humanity suffers from disease germs conveyed in air and water.

What is Life?

At a recent session of the American dental convention, in the course of some remarks upon microscopic investigation, Dr. Atkinson said: "We shall never know anything about life until we go to the bottom of the matter of function. There is a substratum denominated 'atom,' which is the least manifestation of life that we know of. Atoms are endowed with life—they can't be killed. We have been told that the molecular life of our food is killed. A statement like that is either a *lapsus linguae*, or it shows an utter misapprehension of the subject. Atoms coalesce and manufacture molecules; plasma is an aggregation of molecules. Something must die that something else may live, throughout the range of organic life. We have crystalline life, and below that granular life, molecular life and atomic life. A crystal is regularly arranged granules that are regularly arranged atoms.

"The doctrine of inorganic or azoic existence will not do in this day. If we wish to know the origin of life, we must define the territory we are speaking of; when the conscious life has left the body, we have organic, cellular and molecular life left, and that is the food which we like to suck from the beefsteak. It is simply a polarization and depolarization of atoms that constitutes molecular mass. We cannot disrupt molecules without reducing to ultimate atoms; there is no such thing as death. Matter means mother. Every one who has followed me knows I have given as complete an answer to the question we are discussing, as that two and two are four. When the blessed love of the Father of Light comes in and illumines us, we are endowed with the capability to perceive. The doctrine that *omne vivum ex ovo* is pretty old, as old as Harvey. If the protoplasmic mass is an egg, that is true; there are no bricks without mud, there is no loaf without dough. What do Bastian's investigations prove? Only that these points are so small as not to have been detected before; they do not prove that the germs are not essentially eggs. What is an atom? It is in size about the two hundred millionth part of an inch. If one side of it is warm and the other cold, there is polarization and depolarization, and that brings it to a point where freezing begins, and that is crystallization. When we have investigated deep enough, we shall be prepared to understand the processes, and they will be as plain as the freezing of water."

AN IMMENSE TELESCOPE.—A telescope is now in course of construction in Dublin, says the *Montagszeitung* of Berlin, for the observatory of Vienna. It is to be 32 feet in length, have an objective glass of 26-inch diameter, and the large brass case, weighing eight tons, is to have a chamber 12 feet in length and 4½ feet in diameter. The tube is to be entirely of steel, and all friction of the axis will be avoided. The instrument is to be finished in 1878. Telescopes have been made of such magnifying powers as to enable those using them to detect bull-lings or works, if there were any, in the moon, so large only as Westminster Abbey; so that anything like cities, or roads, or masses like armies, for instance, in motion, would easily be seen. But nothing of the sort appears to the keenest eye.

Recording and Photographing Sound.

Prof. Vogel, in a letter to the *Photographer*, Philadelphia, Pa., says that Konig, at Paris, has constructed an apparatus, consisting of a little drum, over which is stretched a very elastic skin. A stream of gas let through this drum will born as usual; but as soon as a tone (by singing) strikes the skin stretched over the drum, the gas light commences to shake in a wonderful manner; and if we look at it in a rotating mirror, we observe peculiar figures, which change according to the different notes; and by using a burning gas producing a light of great chemical effect, we can photograph these peculiar figures. What kind of gas will answer for this purpose is still an undecided question, but this much is certain, there are in this respect great problems yet to be solved; we may succeed, perhaps, in photographing speeches instead of stenographing them as usual.

In connection with the above it may be interesting to read the following mode of

Recording Musical Performances.

A mechanic of Bridgeport, Conn., has invented an electrical apparatus which records musical sounds as they are played, which has been successfully applied to an organ at New Haven. The organ is connected with the recording apparatus by a music telegraph, and its operation is very simple indeed. Beneath each note of the three manuals and of the pedals, and connected with each stop of the organ, is a small brass spring, which is pressed down whenever the piece to which it is attached is brought into action. From each spring wires run to a galvanic battery of 12 cells, and to the recording apparatus, which may be situated at any convenient distance from the organ. When the spring is pressed down, connection between the battery and recording apparatus is opened and the electric current passes through and is made to impress a paper very much in the same manner as the ordinary telegraphic machine.

We may also call attention to an apparatus for transmitting musical tones by telegraph, concerning which an item has been traveling the rounds of the papers, and which depends upon the well known principle that the difference in musical tones consists in the difference in the number of vibrations in the air in a given time. The invention consists in transmitting a series of impulses of induced electricity of high tension, corresponding in number to the number of audible vibrations constituting a given musical tone through living tissue in contact with any resonant substance, or through a coil surrounding a bar of iron or the core of an electro-magnet, the succession of currents being produced by an induction coil or other apparatus for inducing a secondary current, and being caused by the action of any suitable circuit interrupter situated in a primary circuit.

We agree with a contemporary that it would appear from the above and numerous similar recorded instances that there is a growing tendency to complicate machinery by the introduction of electric contrivances, which in many cases are utterly uncalled for and unnecessary.

A New Classification of Elements.

For some time past the Russian chemist, Mendeleef, has proposed a classification of simple substances which satisfactorily details the leading properties: atomic weight, density, point of fusion, etc. He has discovered that all these bodies form perfectly regular series, and that given the first term of a series, the properties of the bodies forming the succeeding terms may be accurately determined beforehand by means of certain coefficients. In the series which he has thus classified, and which include all the known bodies, there are several gaps, but the Russian savant, certain of the correctness of his views, maintains that, sooner or later, chemical discovery will determine the existence of bodies still unknown, the principal properties of which, however, he is enabled to foretell.

It is a remarkable fact that the new metal discovered by M. Lecoq, of Boissandran, and called by him *Gallium*, fills one of these gaps, and, according to what is actually known of its properties, they quite coincide with those predicted, in accordance with the new theory, for a metal to which the name of *Ekaaluminum* had been given. The new metal has a considerable analogy with zinc, though whiter and more brilliant, and approaching silver in appearance. M. Lecoq has, however, only been able to obtain it in very small quantities, which are not sufficient to determine all its properties.

SOLAR PROTUBERANCES.—At a recent meeting of the French Academy P. Secchi presented still another of his reports of observations of the solar protuberances and sun spots, the period of observation being from April 23d to June 28th, 1875. He records the extent of surface of the spots (according to a method described), instead of the number, as formerly. He finds *inter alia* that the daily number of protuberances and the surface of the spots have gone on steadily decreasing; that the large eruptions ceased when the large spots disappeared; that the maxima of protuberances at the poles had disappeared, as also the faculae which had collected round the poles, forming coronae; and that lofty protuberances were becoming very rare. It appears, then, that we are now near the minimum, and that an increase may be expected shortly; and P. Secchi invites astronomers to carefully note the phases of this increase.

MINING SHAREHOLDERS' DIRECTORY.

ASSESSMENTS.—STOCKS ON THE LIST OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq'nt.	Sale.	Secretary.	Place of Business.
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Company.	Location.	No.	Amt.	Levied.	Delinq't.	Sale.	Secretary.	Place of Business.
Alta S M Co	Washee	3	50	Jan 27	Mar 2	Mar 25	W H Watson	302 Montgomery st
Amazon Onns M Co	New	2	50	Feb 24	Mar 28	April 17	R P Hosmer	330 Pine st
California Flag M & M Co	Ely Dist	2	50	Jan 1	Mar 1	Mar 1	W H Watson	302 Montgomery st
Caledonia S M Co	Washee	16	300	Jan 31	Mar 1	Mar 22	R Wegener	414 California st
Collabar-Potssi M Co	Washee	9	500	Jan 31	Feb 23	Mar 15	O S Outtiss	418 California st
Crown Point M Co	Washee	24	100	Jan 10	Feb 17	Mar 1	Chas E Elliott	419 California st
Europa M Co	New	2	50	Jan 1	Mar 1	Mar 1	W H Watson	302 Montgomery st
Europa M Co	Washee	5	25	Jan 28	Mar 3	Mar 20	R B Noyes	419 California st
Glasgow G & S M Co	New	2	25	Feb 24	Mar 28	April 17	R P Hosmer	330 Pine st
Gold Mountain M Co	Dal	25	50	Jan 31	Feb 28	Mar 15	W A Knapp	Nevada Block
Imperial Charcoal M Co	Dal	16	50	Feb 1	Mar 1	Mar 1	Arthas	Merchants' Ex
Hale & Norcross S M Co	Washee	49	500	Feb 8	Mar 14	Apr 5	Joel F Lightner	Nevada Block
Imperial S M Co	Washee	26	100	Feb 15	Mar 21	April 11	W E Dean	419 California st
Iowa M Co	Washee	5	25	Feb 1	Mar 15	April 5	A D Carpenter	305 Clay st
Washington M Co	Dal	2	50	Jan 2	Mar 2	Mar 2	W H Watson	419 California st
New Casa M Co	Dal	2	50	Feb 12	Mar 22	April 15	D F Verneil	409 California st
New York Cons M Co	Washee	17	82 1/2	Jan 25	Feb 29	Mar 21	D L Thomas	419 California st
New York M Co	Washee	8	50	Jan 26	Feb 29	Mar 21	D L Thomas	419 California st
North American Gravel M Co	Dal	1	100	Jan 1	Feb 2	Mar 10	D L Thomas	419 California st
Overman S M Co	Dal	34	300	Feb 9	Mar 15	Apr 5	Geo D Edwards	414 California st
Pauper M Co	Idaho	7	20	Feb 26	April 3	April 24	W F Bogart	328 Montgomery st
Picache S M Co	Ely Dist	12	40	Feb 25	April 6	May 2	C E Elliott	419 California st
Pogon M Co	Idaho	5	50	Feb 25	Mar 23	Apr 1	Arthas	Nevada Block
Savage M Co	Washee	22	100	Feb 9	Mar 14	Apr 3	E B Holmes	309 Montgomery st
Senator S M Co	Washee	13	50	Feb 29	April 8	April 27	J H Silder	330 Pine st
Sierra Nevada S M Co	Washee	43	100	Feb 23	Mar 28	April 18	W H Watson	309 Montgomery st
Sierra Nevada Cons M Co	Washee	25	25	Feb 23	Mar 28	April 7	D Walder	Merchants' Ex
Snohom M & M Co	Washee	13	50	Dec 20	Jan 29	Feb 28	W H Watson	302 Montgomery st
Trojan M Co	Washee	1	50	Feb 14	Mar 16	April 6	D Wilder	Merchants' Ex
Union Gravel M Co	Dal	1	50	Feb 1	Feb 21	Mar 1	M G Game	330 Sansome st
Wells Fargo M Co	Washee	12	200	Feb 18	Mar 22	April 10	M G Game	309 Montgomery st
Wear Eagle M Co	Idaho	11	50	Feb 4	Mar 11	Apr 3	Lonis Kaplan	Merchants' Ex
Wells Fargo M Co	Washee	4	25	Jan 29	Mar 9	Mar 31	C H Bogart	358 Montgomery st
Woodville Cons M Co	New	1	50	Jan 29	Mar 2	Mar 13	W H Watson	302 Montgomery st
Woodville M Co	Washee	13	100	Jan 29	Feb 23	Mar 13	M H Melman	309 California st

SALES OF LAST WEEK AND THIS COMPARED

OTHER COMPANIES—NOT IN THE LISTS OF THE BOARDS.									
Alameda Coal M Co	Cal	1	100	Feb 20	Mar 15	Mar 31	R F Burge	409 Battery st	
Albany Quicksilver M Co	Cal	1	10	Jan 20	Feb 21	Mar 31	J G Riley	331 Montgomery st	
Antiles M Co	Cal	1	20	Jan 20	Mar 11	Mar 27	H M Morgan	113 Leidesdorff st	
Buckeye Water & Hydr'ls M Co	Cal	2	50	Jan 11	Feb 14	Mar 26	W H Lowden	331 Montgomery st	
Chico M Co	Cal	2	30	Jan 11	Feb 14	Mar 27	F F Richards	111 1/2 Leidesdorff st	
Commonstock Beneficiating Co	S F	1	50	Jan 26	Mar 1	Mar 20	O C Miller	420 S Esome st	
Coos Bay Coal Co	Oregon	3	75	Jan 13	Feb 19	Mar 9	T P Beach	124 Montgomery st	
Eagle M & M Co	Nev	3	50	Jan 19	Feb 25	Mar 16	H B Byrne	533 Kearny st	
El Dorado W & G M Co	Cal	3	20	Feb 2	Mar 2	Mar 25	Huckel	378 Montgomery st	
Electric M Co	Cal	3	5	Feb 4	Mar 9	Mar 25	H B Pabel	413 California st	
Eureka Stone Manufacturing Co	S F	3	15	Jan 26	Mar 1	Mar 22	P D Mowall	567 Market st	
Excelsior Quicksilver M Co	Cal	4	5	Feb 23	Mar 24	Apr 23	A Halsey	240 Sansome st	
Franklin M Co	Washoe	1	100	Feb 15	Apr 15	Apr 15	J H Hann	329 Battery st	
Fresno Quicksilver M Co	Cal	3	15	Feb 29	Apr 7	Apr 28	R Wegene	414 California st	
Great Eastern Cons Q M Co	Cal	2	25	Jan 13	Feb 14	Mar 3	J G Riley	331 Montgomery st	
International G M Co	Cal	2	25	Feb 1	Mar 6	Mar 25	J M Buffington	311 California st	
Jackson M Co	Utah	4	25	Jan 25	Feb 21	Mar 25	Charles E. Lee	304 California st	
Junkins Coal M Co	Nev	4	30	Jan 16	Feb 29	Mar 18	A Barra	304 California st	
Jacob Little Cons M Co	Washoe	2	25	Feb 14	Mar 17	Apr 15	W R Townsend	333 Pine st	
Josephine Gravel M Co	Cal	10	10	Feb 23	Mar 25	Apr 15	W Small	531 California st	
Kelsey Cons S M Co	Cal	15	5	Feb 2	Mar 7	Mar 27	J J Moore	311 Montgomery st	
Leviathan M Co	Washoe	2	50	Jan 17	Feb 16	Mar 8	F E Luty	507 Montgomery st	
London Quicksilver M Co	Napa Co	4	4	Feb 88	Mar 23	Apr 24	A Halsey	200 Sansome st	
Mariposa Land & M Co	Cal	4	100	Feb 23	Mar 24	Apr 15	L Lavytt	Nevada block	
Monumental M Co	Cal	5	5	Feb 3	Mar 18	Apr 15	W W Martin	328 Montgomery st	
Mount Savage M Co	Utah	3	10	Feb 24	Mar 31	Apr 20	D F Verdenal	409 California st	
Moore's Flat Blue Gravel M Co	Cal	1	10	Dec 20	Feb 20	Mar 6	W M Small	531 California st	
Morgan M Co	Cal	1	25	Feb 15	Mar 15	Mar 25	W G Warr	401 California st	
North Coast Tunnel & Smelt'g Co	Cal	1	10	Feb 15	Mar 15	Mar 25	O Q Tripp	401 California st	
Ocean View Quicksilver M Co	Cal	1	10	Feb 12	Mar 21	Apr 15	D Bucker	Nevada block	
Omega Taho Mt M Co	Cal	9	5	Feb 4	Mar 13	Apr 3	D Widder	Merchants' Exchange	
Oakland Quicksilver M Co	Cal	1	10	Feb 15	Mar 21	Apr 3	W Wraslow	Nevada block	
Orinda R & S M Co	Oregon	1	100	Feb 15	Mar 30	Apr 29	W Willis	Nevada block	
Quadrille Cons M & M Co	Cal	1	5	Feb 24	Apr 4	Apr 22	W F Rozart	323 Montgomery st	
Rock Island G & S M Co	Washoe	10	50	Jan 8	Feb 11	Mar 2	J W Clark	408 California st	
San Jose M Co	Cal	5	50	Feb 2	Feb 17	Mar 2	J W Clark	408 California st	
Sierra S M Co	Nev	4	10	Feb 8	Mar 1	Mar 23	A Halsey	200 Sansome st	
Sierra S M Co	Cal	7	50	Jan 12	Feb 14	Mar 2	A Halsey	200 Sansome st	
West Point G & S M Co	Washoe	1	10	Feb 2	Mar 7	Mar 28	David A Jennings	401 California st	
West Point G & S M Co	Cal	1	10	Feb 23	Mar 21	Apr 8	L Martin	401 California st	
Winning M Co	Cal	6	100	Feb 24	Apr 3	Apr 24	J M Buffington	311 California st	
Young America M Co	Nev	3	30	Feb 18	Mar 22	Apr 10	R H Brown	402 Montgomery st	

Table of Highest and Lowest S. F. Stock Exchange

Name of Co.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Consolidated Alabama M Co	Cal	J H Lovejoy	330 Pine at	Annual	Mar 1
Daney G & S M Co	Washoe	Called by Trustees	320 California at	Special	Mar 2
Electro M Co	Cal	A B Paul	818 California at	Annual	Mar 16
Golden Chariot M Co	Idaho	L Kaplan	Merchants Ex	Annual	Mar 17
Golden Chariot M Co	Idaho	L Kaplan	Merchants Ex	Annual	Mar 17
Hale & Norcross M Co	Washoe	J F Lightner	Nevada Ex	Annual	Mar 17
Insurance M Co	Cal	M Sanders	308 Montgomery at	Special	Mar 17
Lauriehooker & Co	Nev	Called by Trustees	331 Montgomery at	Special	Mar 2
Pioneer M & Co	Nev	R H Brown	402 Montgomery at	Annual	Mar 17
San Francisco Copper M Co	Cal	DeGlasmont	Cor Foster & Jackson	Annual	Mar 17
Veregeted California M Co	Nev	Called by Trustees	Called by California at	Special	Mar 17
Senator Con M Co	Nev	Geo O Munro	419 California at	Annual	Mar 17
Senator Con M Co	Nev	Geo O Munro	419 California at	Annual	Mar 17
Yellow Jacket M Co	Cal	D A Jennings	401 California at	Annual	Mar 15
Yellow Jacket M Co	Washoe	Called by Trustees	Gold Hill	Special	Mar 15

Name of Co.	Location.	Secretary.	Office in S. F.	Amount.	Payable.
Alpe S & Co	Ely District	D S Squire	Stevens's Bldg	25	Feb 15
Black Bear Quartz Co	Washoe	H O Kibbe	419 California at	1 00	Feb 15
Cos Virginia M & Co	Cal	L W Oliver	316 California at	25	Feb 15
Elmer M Co	Washoe	Chas H Flah	401 California at	1 00	Sept 15
Indian Queen M & M Co	Nevada Co Cal	D A Jennings	401 California at	50	Dec 31
Maple M Co	Nev	A K Burdrow	50	Feb 15	
Northern Belle M & M Co		R H Brown	442 Montgomery at	1 00	Feb 15
West Comstock G & S M Co	Washoe	W Willis	339 Montgomery at	50	Feb 25
		Oliver G Wood	334 California at	1 00	

There has been some little advance in mining \$820,000 by the Belcher and Crown Point.

There has been some little advance in mining stocks during the past week, mainly confined, however, to a few stocks. The greater portion of the list shows little animation, although everybody is waiting for this long expected "spring rise." The Bonanza mine continues \$820,000 by the Balch and Crown Point. The Dancy Mining company is this last so far to increase its capital stock. A meeting will be held on the 27th inst. to decide on a proposition to increase the capital stock from \$2,400,000 in 24,000 shares to \$10,800,000 in 108,000 shares, of the par value of \$100 per share.

to send down large amounts of bullion, the yield for this month reaching nearly \$3,000,000—an immense amount for a single mine to turn out. The immense production of this mine is having a very great effect on the finances of the nation. It is stated that during the past week the Government bought from two of our largest banking corporations 300,000 ounces of the fine silver contained in bars at \$1.16 per ounce, the sellers paying the parting charge of 2½ per cent., which makes the price of the fine silver about \$1.1333 per ounce. It is believed that this is the lowest price ever paid for fine silver in the United States. The standard value of

Our stock tables show the number of shares sold and highest and lowest prices of prominent stocks for the past week. A slight examination will also show the highest and lowest prices for the month passed.

Thomas M. Blair, for 13 years Serasant-at-Arma of the San Francisco Stock and Exchange Board, left on the *Mikado* for Honolulu on Tuesday. His hasty departure was caused by the advice of physicians, who told him that one of his lungs was entirely gone, the other badly affected. Just before his departure a subscription was taken up in the Board room, and in half an hour he was made happy by the receipt of \$12,500. A generous set, the brokers

fine silver is \$1.2929 per ounce. This purchase will be immediately coined into subsidiary coin for Government account. It is now said that the Government contemplates redeeming the fractional currency with silver.

Dividends from Anderson Lumber Co. are \$1,386,000, of which the Consolidated Virginia paid \$1,080,000. The amount paid in dividends during the corresponding month last year was \$638,700, of which Consolidated Virginia furnished \$324,000. The great gain is chiefly owing to the increase of that company's dividends from \$3 to \$10 per share. In February, 1874, the total dividends of local incor-

porations amounted to \$1,233,800, of which mining companies paid \$855,000, including \$820,000 by the Belcher and Crown Point.

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THE *City of Panama*, which arrived here on the 21st ult., brought down from Victoria several specimens of the native woods of British Columbia, among others a cross section of the Douglas pine. This section measures 27 feet in circumference.

NEARLY all the mining claims in Jackson county, Oregon, heretofore worked by the Chinese, have been jumped by the Whites.

THE 'Alhion mill company in Mendocino county will saw 16,000,000 feet of lumber the ensuing year.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

California.

AMADOR.

THE PLUMBOCK ROCK MINE.—*Amador Ledger*, Feb. 27. A correspondent writing from Plumbocock on date of February 27th, gives the following information concerning the quartz ledge recently discovered near that town: "The gold-bearing quartz ledge discovered some time ago by John Evans is developing nicely. The owners feel much encouraged, and the citizens begin to look upon it as an important accession to the resources of this place. This claim has been named the Plumbocock Rock mine, and is worked by John Evans and Philip Kleres. They intend to sink upon the ledge to the depth of 100 feet, and then drift. The shaft is now 40 feet deep, and the ore body continues to improve as depth is attained. The ledge at present is over three feet in width. Since the first of January there has been taken out about 45 tons of good paying rock, which it is expected will average between 95 and 110 per cent.

CLEAN-UP.—The clean-up of the crushing of the rock from the Moutierichard mine, two miles from Jackson, averaged \$15 per ton. Nine tons were crushed at the Kearing mill, with the above result. The owners talk of securing new Stephen Kendall's mills.

MAXIMUM DEPTH.—This property begins to form up of the future mines of the county. A rich vein of quartz, varying from 18 inches to two feet in width, has been cut, which is expected to yield something like \$30 to the ton. Some of the rock has yielded as high as 60 cents to the pan. It is the opinion of some mining experts that the gold obtained in such large quantities by placer mining in the locality of this mine in early days, came originally from the ledge struck in the Maximilian. As an example of confidence in the permanent nature of this mine, we may mention that S. S. Maun, of Sutter Creek, has expressed his willingness to put up a 10 stamp mill, and rely upon the proceeds of the crushing for his pay.

CALAVERAS.

RICH ROCK IN THE GWIN MINE.—*Calaveras Chronicle*, Feb. 25. We learn that rich rock has been struck in the 100-ft south level of the Gwin mine, at a distance of 95 feet from the shaft. The ledge is over four feet in width, and we are informed that it is composed of so good rock as has yet been found in the mine. The quartz is so excessively slow that the work of running the level is necessarily slow and tedious, but in a short time it will have been driven far enough to permit of an uprise preparatory to stopping.

GRAVEL MINING.—A visit to the numerous gravel mining enterprises in this vicinity develops the fact that operations are being pushed with exceptional briskness, even for the winter season. All the claims are being steadily and energetically worked with results that, generally speaking, are eminently satisfactory. There is abundance of water, and as ample preparations were made during the dry season for active operations through the winter, the claims are all in condition for working to the best possible advantage. Quercel & Co., proprietors of the "Old Boh Pea claim," in the Chille gulch, continue to take out rich gravel. The mine is worked through the new incline run last year, and the gravel is being raised by means of a hoist and hoisted as ever. The gravel has to be hoisted, dried and pulverized before it will wash, and yet it is so rich that the mine is paying handsomely. Two tunnels are being run in the well known Durfee claim, the object being to ultimately connect them for the purpose of permitting the employment of a large force of hands in hoisting. Each tunnel is being worked with a good track and cars, and as the headrock pitches into the hill, animals are employed in hauling the gravel upon the incline to the dumpbox. When the new system of working the mine is fully developed it will unquestionably prove as remunerative as it did during its palmy days as a hydraulic. In Cook & Co.'s hydraulic, at Red Hill end on the Calaveras, panning is going steadily forward. Every claim is progressing favorably, and the prospects are flattering that the season will prove a remunerative one to the company. Nons deserve better success than Cook & Co., and we hope the only thing that will bother them in this world will be what to do with their money.

FRESNO.

OLD BEARING QUARTZ.—*Fresno Examiner*, Feb. 23. During the past week a number of excellent specimens of gold bearing quartz, some of it very rich, has been shown to us. John Oden, of Borden, showed us specimens which he obtained from the vicinity of the old Claims Mader mine, on the north side of the San Joaquin. The specimens showed a considerable quantity of the gold. Mr. Oden informed us that he had found a very well defined vein of quartz, from which he had obtained his specimens. Washington Armstrong and John McDowell, who live near the head of Big Dry creek, left with us some specimens of rock, literally spangled with gold. These specimens they obtained from a quartz ledge found near the head of Big Dry creek. They traced the lead nearly a mile. They also had some two ounces of quartz gold, which they had obtained in the bed of a ravine through which the ledge passed. The Confidence mine, situated on the Fresno river, owned by James F. Dodds and others, we are informed, still continues rich and promising. The Champion mine, owned by Keyes and Jensen, has been panned to a depth of more than 50 feet. The ledge is well defined and increases in width. The quality of the ore continues to improve all the time, and it is now established beyond a reasonable doubt that the mine is rich and extensive. The last crushing of ore from the extension of the Champion, and owned by Smith and others, we learn gave a yield of nearly \$50 per ton. With the unlimited number of quartz veins that permeate the foothills of this county, nearly all of which show fine gold, it seems strange that many paying quartz mines had not already been developed in Fresno county.

INYO.

PANAMINT.—*Tulare Times*, Feb. 26. A gentleman who has the best of opportunities of knowing, told us a short time since that the Surprise Valley company are highly elated at the magnificent development lately made in the Hemlock. At a depth of 400 feet, the lowest point reached, it shows a regular bonanza, eight feet wide of the richest ore for the mass they have ever found. The company, we understand, do not expect to stop short of 1,000 feet, or another Constock. The Wyoming does not clement materially, being down about the same as the Hemlock, but at which point it is full as good if not better than at any previous one, therefore great hopes are entertained of something more. Further progress in the Hemlock is being made exclusively on company ore, although an occasional custom lot has been worked. Its average production up to January was very nearly \$50,000 per month, produced at a cost of \$30,000, leaving quite a handsome profit for a starter. Dave Nagle had a lease of the Jacob's mill, and was running it successfully on ore from a mine of his own, the name of which we have forgotten. Panamint is considered as decidedly on the up grade.

DEFANCE. (Coco District).—*Coco Mining News*, Feb. 24. The drift being run from the south drift on the 60-ft level has been driven about 40 feet, all the way through an exceedingly rich body of ore. On the 80-ft level a drift of about the same length has been run south through the same body of ore found in the level

above. The width of this body is, as we stated in our last issue, unknown, and, of course, cannot be ascertained until a cross shaft has been made in the same. As to the length, we can only say that it has been explored a distance of more than 200 feet. In every opening in the mine large blocks of glittering galena met this eye.

DEFANCE.—The mine has been running very successfully during the past week. The company shipped since the 16th inst. 600 bars bullion, and has on hand 200 more. The bullion continues of high grade.

CARLOTTA MINE.—Another rich strike has been reported to us from the Lookout district, by Messrs. H. Shattman & Co., of the above named mine. The Carvella is situated about seven miles from Darwin, on the main belt of the above range near the summit, and about four miles from the spring in the Darwin wash, owned by Mr. E. Reddy. It is pronounced by reliable parties to be one of the richest discoveries ever made in that district, and the owners feel highly elated over their strike. Starting from rich galena croppings a prospecting shaft was sunk of about six feet, disclosing a ledge of about four feet in width of almost solid galena ore, mixed with grey carbonates. The parties have now already about five tons of ore on their dump, which will assay from \$200 to \$300 per ton. It is their intention to continue the work on so valuable a mine, but being in rather limited circumstances, as prospectors generally are, it is a matter of grave doubt if hoisting works will ever make their appearance. The ledge is very large, and the ore is of a fine, larger than their own, in the further development of their property.

NEVADA.

AMERICAN MINING CO.—*San Juan Times*, Feb. 26. The junior of the *Times* made a flying visit of observation to the American mining company's claims on Monday last. The company are working their claims in a thorough and vigorous manner. There are three large pipes used in washing their claims, one at the Gold bluff claims, one at the old Badger company's claim and one at the American claims proper, all of these claims belonging to the American company. The company have about 1,800 inches of water per day, through three immense monitors, which throw the water with powerful and effective force against the benches of the claims. The company are running a new tunnel into their claims, which, when completed, will be about 9,225 feet. There is in the neighborhood of 100 feet of tunnel yet to run, which will be finished in about two months. The company have been working a new tunnel in sinking shaft on the new tunnel, but owing to the water running in so rapidly had to stop working the same; about three or four weeks ago work was again resumed on the shaft, the water having drained out through seams in the rock to the tunnel below, and in a short time the shaft will be completed. The company have now about 50 undercurrents connected with the main shaft, and are clearing the way for two more, 24 feet wide each, to be placed next to the Middle Yuba river. Four more undercurrents will be built soon. Sixty men are employed in working these claims, under the charge of George C. Spooner, Esq., all white men. No Chinamen are employed. The claims are worked night and day.

THE MINES.—*Grass Valley Union*, Feb. 26. We are clearly impressed with the conviction that the mining business of Grass Valley, in the coming spring, will be unusually brisk. We say this because there are many prospectors at work, and most of them are taking out ores that will pay. The early prospect that a process, by which almost all the gold and silver in ores can be saved, will be in active and successful operation, has caused this renewed interest in the matter of prospecting. Besides the prospecting, the company are working a mine that is being worked with success by mill process. Ideo is yielding steadily and regularly, and will be ready for the next dividend. The ore in the mine shows that pay is there for years to come. The Eureka, although not paying as she once did, has hopes of good success before her. We believe that the Morehouse ledge, and being prospecting by the company, will develop the body of ore to which is the district in which the gold has taken. Omshe has lately given a good account of herself. Those mines down the creek, as the Omshe is, appear to be looking up, after years of idleness and neglect. The Omshe is one of them. Splendid ore is now coming out of the lowest depths of the mine, and all agree that the ledge increases in strength and in quality. Everything is progressing favorably, and the prospects are flattering that the season will prove a remunerative one to the company. Nons deserve better success than Cook & Co., and we hope the only thing that will bother them in this world will be what to do with their money.

PLACER.

COMPLETED.—*Dutch Flat Forum*, Feb. 24. The Badger shaft, passing down through the Badger claim a distance of 150 feet, to a branch run off from the Yankee tunnel, is completed. The connection was made on Saturday. This shaft intersects the Yankee tunnel about 1,200 feet from its mouth. The rock has been very hard and the progress slow, but as is always the case where there is any pay, the work was persevering, the object is accomplished. This is another step in the progress of the extensive developments being made by the Cedar Creek company under the management of Col. T. B. Ludlum.

GRAVEL MINES.—Since the storms have abated, and clear weather has set in, our various miners display their usual vigor in resuming the work of the various claims. The water is so low that it could obtain well, resumed washing, and are now panning away. The Elmore Hill claim continues washing without interruption, only turning off to clean up or to change the position of the plants. The Central claim has resumed washing and is running night and day. The Jehoshaphat claim is idle at present, pending the running of a shaft. The water is so low that it could obtain well, resumed washing, and are now panning away. The Elmore Hill claim continues washing without interruption, only turning off to clean up or to change the position of the plants. The Central claim has resumed washing and is running night and day. The Jehoshaphat claim is idle at present, pending the running of a shaft. The water is so low that it could obtain well, resumed washing, and are now panning away. 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THE ENGINEER.

The Genesis of Architecture and Engineering.

Architecture and engineering, until within a comparatively recent period, mingle at so many points that they can scarcely be said to have a separate history. Indeed, until about the fifteenth century, it may be said that neither had any history at all, save that which has been derived from observation of the remains of architectural and engineering works. In early times opportunities for the interchange of knowledge were few, while the means for recording the same were still more limited; in fact, the means for permanent record were wanting altogether. Hence the slowly accumulated results of the experience of the early centuries was altogether lost during the political and dynastic revolutions which preceded the glory of Greece and Rome; and but little of the wisdom of even those later empires has survived the wanton destruction of the dark ages which succeeded their downfall.

Passing by the early attempts at design and construction, which merely supplied the necessities of man, architecture and engineering doubtless had their origin in ancient Egypt, and were carried from thence to Chaldea and Babylonia, afterwards passing into Greece, Carthage and Rome, and finally through Asia and across the Northern plains of America, down the Mississippi valley to Central and South America. The Egyptians have left no record of how they accomplished their difficult works of transport and lifting. Neither have any of their successors, save the Romans, from whom we have derived but faint and imperfect ideas.

The Egyptians must by some means have lifted vertically into place obelisks weighing upwards of 400 tons. They transported, from a considerable distance, at least in one instance—the statue of Rameses the Great—a stone block which weighed over 800 tons; while a block still lies in one of their quarries squared and evidently intended for transportation entire, which weighs not less than 1,135 tons! In India stones weighing 25 and 30 tons are found forming pyramidal roofs, at a height of 70 and 80 feet from the ground. Similar weights, but not at so great a height, were lifted in Persopolis, during the reigns of Xerxes and Darius. The early Chinese appear to have been more careful of their strength or more lacking in skill; for although they moved very heavy blocks for building their bridges, which are almost always permanent structures of stone, they took care to have them only of moderate dimensions. But the Peruvians, whose ancestors—the Western mound builders—must have come over from Asia, brought with them much architectural and engineering skill, for we find that they employed blocks of from 15 to 20 tons, which they must have carefully lifted and fitted with the greatest nicety in their well designed work.

The only modern effort at moving such excessively heavy blocks is the case of that which now forms the base of the statue of Peter the Great, at St. Petersburg, in Russia, which weighs 1,200 tons. There can be no doubt that people who were capable of erecting such works as have come down to us from ancient Egypt must have possessed a large amount of engineering and mechanical knowledge. Those people were pyramid and temple builders for at least ten centuries, as we know from undoubted records that have been preserved; and their skill and knowledge must have been cumulative. That they had a knowledge of iron and steel has been of late years well substantiated. That the Assyrians at least were acquainted with the pulley is known from the fact that one of their tablets recently exhumed shows a man drawing water, as if from a well, over a single pulley block. If the single pulley was known, why not the double and compound block? If known to the Assyrians, it could scarcely fail of being known to the superior race which inhabited Egypt. Another tablet informs us that they had a public officer who was known as "the master of the works;" so that there must have been even in those early days an intelligent division of labor. Under the Roman empire there was almost or quite as great a division as now exists in our perfected system of labor and design. In Vitruvius' *De Architectura*, we find among other things a chapter on machines for raising and transporting great weights, and even on the construction of looms.

Although the Egyptians have left no record of how they accomplished their great works, it is quite certain that their long experience must have proved such a tax on their ingenuity, as in all probability to have led to a comparatively perfected skill in, and knowledge of, even many modern mechanical appliances.

They build so well that many of their works have come down to us through more than 30 centuries, so perfectly preserved that our imagination readily creates, with more or less of probability, the devices and methods by which they must have wrought. Of even the later structures of Greece and Rome, whose people were largely in advance of their predecessors, and who built with complex arch work

and stairways, and beautified with accurate elliptic lines of curvature and various ornamental works of elegant design, we know little or nothing as to what were the methods, or how the stone cutter was so guided in his intricate work as to make each piece fit accurately in its place in the complicated whole. We know much historically, and by studying its remains, of the Parthenon, but we know little or nothing of the technical methods employed in cutting or putting in place its magnificent columns.

Did the architects of those days lay out their work by the same rules as are now followed? Were their designs drawn on parchment, on wooden panels or waxen tablets? Of all this we know nothing. But we do know that architecture had at that time reached a point of perfection which has never since been equaled.

But the labors of the ancients were not confined altogether to temples, palaces and tombs. Works of utility, canals for irrigation and for internal commerce were also undertaken on a scale quite as gigantic as were their architectural works. Traces of many of those works still remain, which, when compared with the few records that have come down to us, show that engineering, as well as architecture, had no existence in pre-historic times.

The irrigation works of Egypt 3,500 years ago will compare favorably with any of modern date, both in perfection and extent. One of their reservoirs was 150 square miles in extent, and maintained by a dam 30 feet high, 180 wide, and at least 13 miles long, and was capable, and no doubt did, irrigate an extent of more than 1,300 square miles of country, or a region about twice as large as the entire San Joaquin valley, in this State.

The same people excavated, and for ages used a ship canal from the Red to the Mediterranean sea. M. de Lesseps did but little more than open up anew this ancient canal.

The Babylonians also had their canals for the double purpose of commerce and irrigation, one of which has lately been traced for a distance of nearly 500 miles. These people always planted willows—or a tree similar to the willow—along the banks of their canals. It was upon those "willows" and along the banks of the smaller irrigating canals that the children of Israel hung their harps when they became too despondent to enjoy their music during the long years of their captivity.

The Assyrians, also, constructed large irrigating works. Owing to the uneven face of their country they were of less extent; but for the same reasons required far higher engineering skill—such as tunnelling through rocks and hills, and building dams of solid masonry by which to take the water out of their swift flowing rivers.

The irrigating and immense navigable canals of China, many of them built in very early ages, still exist, as do their immense walls, bridges and aqueducts.

How were engineers educated who constructed those immense works, and what were the instruments and appliances with which they were enabled to accomplish them? We know that the Egyptians at least had some knowledge of surveying, for an ancient author tells us that they had maps on which they recorded their marches. Recent researches in Assyria have also made us acquainted with the fact that the Assyrians had, among their titled men, a "Lord of Canals" and the "Establisher of Irrigation Works."

The magnificent aqueducts, tunnels, roads and works of defense of the Romans and Etruscans are familiar to us in their ruins and in history, which assure us that the art of engineering was well understood by those under whose direction they were constructed; but all knowledge of modes of designing and methods and appliances for construction have been lost to the world. The genesis of architecture and engineering dates far back into the early history of man. How many centuries were required to arrive at the degree of perfection made by the cotemporary of Abraham we know not; but we do know that very little progress was made from that time for nearly 2,000 years afterwards, and that what was gained during the supremacy of Greece and Rome was lost quite as speedily as it was won.

Modern engineering dates from the revival of the arts and sciences in the 12th and 13th centuries, and will form the subject of another chapter in a future issue of the Press.

A NEW SCHEME FOR CROSSING THE MERSEY.

A large and influential meeting was recently held in Liverpool for the purpose of inspecting the plans prepared by Mr. Morton, C. E., for crossing the Mersey by means of an iron tunnel, to be sunk at the bottom of the river, in a line between Liverpool and Seacombe. The scheme embraces the excavation of a trench in the bed of the river to contain the iron tube, which will lie at a depth of about two feet below the bed. This excavation is proposed to be effected by means of large air chambers on the principle of the diving bell. A certain amount of flexibility will be given to the tube by the use of Mr. William Williams' patent joints, which will enable it to be lowered down in sections when the trench is completed. It is proposed to have the Liverpool station at the top of Dale street. From here a tunnel will descend by easy gradients to the river side, join the tube near the Landing Stage, and so on to Seacombe, where it will branch off to Birkenhead, and effect a junction with the Great Western railway there. The cost of the work, exclusive of station buildings, is estimated at £500,000.—*Iron*.

Heating of Journals.

Engineers in charge of machinery and steam engines are constantly troubled by hot journals. In ocean going steamers these may occur during the whole voyage, and it is not an unfrequent practice to allow water to run on crank pins and large journals the whole time the machinery is in motion. With locomotives and steam cars, however, running water constantly on the journals is impracticable, and some other expedients have to be adopted. Plumbago and oil, sulphur, soft soap, and a variety of ingredients have been used by engineers with more or less success. The heating of journals may arise from several causes. The shafts may be out of line, dirt may have got into the boxes, there may be too much thrust on the flanges of the bearings, or by neglect in oiling the journals may have got dry. The desiderata are how to cool the journals and how to keep them so. An old remedy for cooling large journals, and one that seldom fails, is, first wash out the journal and boxes as far as practicable by means of a water hose; lubricate slightly with good oil; remove the oil cap and insert in place of it a tin or copper tunnel; fill this with soft soap and water, of such consistency that it will drop freely from the tunnel tube on to the journal, until it is completely cooled. The soft soap lubricates and at the same time the water cools. This plan has not the objection of sulphur and black lead, which cake on the boxes, and to some degree cake and grind on the brasses.

A patent has recently been issued for a new lubricant, which, it is said, has already come into extensive use, and has been recommended by numerous engineers. The material consists of a fine white powder made from a mineral of talcous magnesian character, free from grit, and is ground and bolted especially for this purpose. When applied, three or four pounds of the lubricant is well mixed with one gallon of oil. This mixture will not become gummy, and is found to be equal in service to about three gallons of the best oil. With new car journals the cellar of the box is filled with waste, well saturated with oil up to the bottom of the journal; then a stiff paste of the lubricant is made with lard or any other oil, and the remaining space around the journal is entirely filled with it. The lubricant is perfectly incombustible.

Railways at the Bottom of the Sea.

When railways on land were first talked of, the projectors were credited with being visionary enthusiasts. What, then, is likely to be thought of those who seriously propose to have railroads under the sea. A submarine carriage of a most ingenious construction has recently been invented in Paris to cross the channel, and for navigating deep rivers and canals. The carriage is of galvanized iron, and is hermetically sealed. As its lightness, compared with surrounding water, would cause it at once to rise to the surface, it is attached to a heavy eight-wheeled truck, which runs on a line of rails laid down under the ocean. It is not fastened so securely, however, but that, in the event of an accident, it could be at once detached and allowed to ascend to the open air, when it would be easy to make for the nearest port. The motive power is supplied by two screws driven by compressed air. An enormous quantity of air is distributed through the interior in numerous pipes, for the benefit of the screw and passengers. We might enter still farther into details, and describe the electric light at the bows, which is to illuminate both the road and the interior of the vessel; the entrance for the passengers, hermetically sealed when all are aboard; the strong glass windows, out of which any one may see the marvels of the deep; the raft carried on the roof, and the divers' chamber at the stern.—*Manufacturers' Journal*.

RESERVOIRS FOR THE MISSISSIPPI.—In order to do away with the enormously destructive freshets which occur every spring along the course of the Mississippi it is proposed to establish a system of reservoirs above the falls of St. Anthony, by building a number of dams to withhold the water from the river in spring and utilize it when necessary. From surveys recently made by United States engineers it appears that the area of the water sheds, or affluents of the great river above the falls of St. Anthony, is 19,903 square miles, which might hold, besides the present supply, 95,500,000,000 cubic feet of water. At low water there is a deficit at St. Paul which might be supplied from these reservoirs and the flow be kept even, or at such a rate of motion as might be required. The time will probably soon come when human providence will deal with the Mississippi—the Nile of America—as the ancient Egyptians dealt with their sacred river. One of the wonders of the engineering skill of those great people was the Lake of Mæris by which the inundations of the Nile were regulated and water stored up for irrigation during the low stage of the river. With such reservoirs as now proposed an equally great and admirable work might be accomplished in America.

STILL ANOTHER MAMMOTH ENGINEERING PROJECT.—The union of the Black and Caspian seas is in contemplation, and a project for the construction of a canal 750 miles in length for that purpose is said to be finding much favor in St. Petersburg and Moscow.

The Santa Rita Placers.

The *Arizona Citizen* says: Mr. Herman Welisch was in town from the Santa Rita placers this week, on a short business visit. Mr. Welisch is a merchant at the placer settlement, has been there for four or five months past, and has had the best means of ascertaining the value and extent of the gold fields and permanency of the diggings. He says there is entire ignorance here in the matter of these placers. Certain parties have gone there expecting to find gold as it was found in early days in California, in great abundance on top of the ground, and to be obtained for this picking up, and of course were disappointed and have left the fields carrying evil reports with them. Those who have staid there and been willing to work are making money, and, even under the discouragement of an entire absence of rain since September, are becoming more and more encouraged at the prospects and results of their daily toil.

These placers are not surface diggings, although considerable gold has been found at a shallow depth. But developments have proven that to get at the heart of these deposits the stripping and drifting must go well into the earth. After getting the pay dirt, the difficulty is the water. But here again, the miners have found that hard work will counteract the difficulty to an extent. Every camp, of which there are about six, with some 350 miners, has its reservoir, and two good rains during the rainy season will furnish sufficient water for present demands, during the next ensuing five or six months.

Mr. Welisch says that he estimates that between \$60,000 and \$80,000 have been taken out in gold dust in these placers for the one year they have been worked. Given a good rainy season and he believes the fields would produce an average of \$1,200 per day, with the present working force. Space will not now permit a description of the different camps and leading men. There is plenty of hard work and good pay. Living is as cheap as in Tucson. Mr. Welisch says that flour is sold there with a slight addition for freight over town price, while other provisions, clothing and dry goods average as low as Tucson prices. The scarcity of rain has compelled more extensive digging for water, with blasting, resulting in considerable success.

There can be no doubt of the value of the placers, but work is required. One man in three months took out \$8,000. This is an isolated case, but there are many cases of less and yet large success. Fred Hughes lately started drifting on a hill which others had abandoned because they could not find gold with a penknife, and in one day's work took out \$16. We shall yet hear great tidings from the Santa Ritas.

Consumption of Lead.

There is not a single lead mine west of the Rocky mountains—that is, a mine worked exclusively for lead ores. Yet the base metal ores on this side of the country furnish about half of all the lead used in the United States. According to a statement in the *Iron Age*, 61,473 tons of lead were produced in the United States during the year 1875. Of this amount 31,200 tons were produced from base metal ores from west of the Missouri. The lead was taken out at the reduction works in Chicago, Omaha, Salt Lake, San Francisco, and at the smaller smelting works connected with silver mining companies. The aggregate supply in 1875 fell short of the preceding year about 7,000 tons. The consumption of white lead last year in the United States was 45,000 tons. The consumption of lead is rapidly increasing. Vastly more is used for plumbing purposes than ever before.

There was a time after the close of the Franco-German war when the lead market became very dull. Considerable lead which had been bought for war purposes was put on the market. This was also true after the close of our civil war. But more recently the leading nations of Europe have been putting their armies on a war footing. These movements will prevent the placing of "war lead" on the market. Russia last year imported 16,000 tons of lead from Western Europe, Spain in time of peace, produces about 65,000 tons of lead annually, or a little more than the United States. But during the last three or four years the production has fallen off on account of the civil war which has been raging in that country. The lead mines of the Western States produced in 1875 only about 22,000 tons, less by 9,000 tons than were extracted from the base metals in the States and Territories west of the Missouri. A few years ago the miners did not know what to do with a base metal mine. Now they know that the presence of lead insures the easy and profitable working of all such ores.—*Bulletin*.

THE FRYER PROCESS.—The Nevada *Transcript* says: We understand there will be a foundry with a capacity of turning out one "process" a day erected soon, at the Fryer works. We hear that a large quantity of freight is now ready in San Francisco for shipment to the same works, which will be used in the erection of extensive works, that will—in the course of the next two or three months—be put up. Mr. Fryer has concluded to have all his work done in this county, and keep his general office here also. Few are aware of the benefit which will be derived by the county from the establishment of such works in our midst. The railroad is convenient to the present works and a side track will soon be run up to them for the more convenient handling of heavy material.

USEFUL INFORMATION.

Refrigerating Railroad Cars.

Any practical method for refrigerating a railroad car so that the temperature may be kept constant at about 40° Fah. will be of immense service for transporting fresh meats, fruits, etc. Efforts have been made to accomplish this by packing ice in the car with the fruit, etc., and trusting to an ordinary ventilator, operated by the speed of the train, for a constant supply of air from the outside to be cooled by the ice before coming in contact with the fruit. But this method has been found very uncertain and expensive, by reason of the large amount of ice consumed by the constant influx of warm air.

A new plan has recently been adopted which is said to be meeting with very good success, and which is described as follows: The car is provided with a fan-blower, driven by one of the axles, by means of which air is forced over the ice and thus reduced to a low temperature. This chilled air is distributed among the fruit boxes through a large perforated pipe laid along the bottom of the car. After it has thus circulated among the fruit, it returns to the blower, and is again forced through the apparatus. By this means the atmosphere of the car is said to be kept at the desired temperature with a very small consumption of ice.

CASTING STOVE PLATES.—As the stove plates of to-day are more or less elaborately ornamented with finely relieved patterns, having sharp corners, and oftentimes with extremely fine lines of depression and elevation, it becomes necessary to use the utmost art and care to have the work as near perfect as possible. To accomplish this, and give the finest possible surface to the casting, beeswax is applied to the patterns. This is done in the following manner: The pattern must be heated till it is hot enough to melt the wax and not burn it. Then apply the wax by rubbing it here and there over the surface of the plate; a small quantity only is required. After which, and while the wax is in a liquid form, give the casting a thorough brushing with a new shoe brush; this will spread the wax uniformly over the entire surface and at the same time remove all the surplus wax. Then allow the casting to cool, and, with a second shoe brush, give it a thorough brushing, and you will have a surface to your pattern that will give you a mold with as sharp corners as your pattern.

THE HAIR OF SQUIRRELS' TAILS FOR BRUSHES.—A useful hint in regard to the utilization of squirrels' tails is contained in the *Chicago Field*, in the form of an extract of a letter written by Mills Brothers, manufacturers of brushes in Brooklyn, N. Y. They state a fact, which is perhaps known to few of our readers, that the so-called camels' hair brushes are made from the hair of the tails of squirrels, the demand for which is increasing very rapidly. It is a question, however, whether the tails of the California squirrels—animals extremely destructive to the crops in this State—will answer the purpose, as they are not true squirrels, but a *spermophile*, or ground squirrel. The hairs on the tail of this animal, although long, are coarser than those of the tree squirrel, and probably less desirable. There would, however, be no difficulty in obtaining a sufficient supply of the tree squirrels, such as the red, the gray, the fox squirrel, etc., throughout the various parts of the country, to meet a very large demand.

CHARCOAL IMPROVED BY AOE.—It is well known that mineral coal deteriorates rapidly by exposure to the atmosphere, through the loss of inflammable gases and the slow oxidation of its other constituents. But with charcoal the reverse is true. Charcoal improves with age by the mechanical absorption of oxygen, which does not combine with it until sufficient heat is applied to burn the coal, at which time the excess of oxygen adds intensity to the flame, and of course produces more heat than would be given off by the coal if burned immediately after being made.

TO DETECT LEAKS IN GAS PIPES.—Apply soapuds to a suspected leaky joint in the gas pipe. The formation of bubbles will show any escape. This is safer than trying the joint with a lighted match. If the leak occur in the branch of a bracket or chandelier, it is repaired by soldering with plumber's fine solder; if it be a very small one, heat the place first with a spirit lamp, and fill the aperture with cement.

TO DETERMINE THE SIZE OF GAS PIPE NEEDED.—Following is the London rule for gas pipe sizes: For 200 lights, two inch iron tube; 120 lights, one and one-half inch; 70 lights, one and one-fourth inch; 50 lights, one inch; 25 lights, three-fourth inch; 12 lights, one-half inch; 6 lights, three-eighth inch, 2 lights, one-fourth inch.

TO FASTEN LABELS TO TIN CANS.—Put a teaspoonful of brown sugar into a quart of paste, and it will fasten labels as securely to tin cans as to wood. Housewives may save themselves much annoyance in the loss of labels from their fruit cans when putting up their own fruit, by remembering this fact.

It is said that one pound of gold may be drawn into a wire that would extend round the world.

TO COAT NAILS WITH TIN.—It often becomes desirable to coat nails with tin when used for certain purposes, as for picture hanging, etc. This may readily be done by any purpose in a very inexpensive and simple manner, as follows: Put half an ounce of powdered tin (which may be procured of any operative chemist) into a common Florence flask; pour on about two ounces of concentrated muriatic acid, and boil over a spirit lamp until the tin is dissolved. When cool, pour into any convenient vessel, and dilute with about an equal bulk of pure water. Drop in the nails required to be coated, holding the vessel so they may all fall to one side. Immerse a piece of sheet copper into the solution, as far apart from the nails as possible, and connect it with the latter by means of a piece of copper wire. The effect of this arrangement is the development of a voltaic electricity, which causes a rapid decomposition of the fluid, and the deposition of tin on the surface of the nails. After being subjected to this treatment for about an hour, the nails will be found to have received a thick coating of metal, and may then be removed from the liquid, dried and polished. Steel pens may be coated in the same manner—a process which effectually prevents their rusting. They may be coated entire or merely the nibs may be subjected to the operation.

HOW TO BUILD A LIME KILN.—Patrick Egau, of Cheshire, Conn., who has had much experience in that direction, sends the N. Y. *World* the following in regard to building lime kilns: Do not use freestone, but build of pure limestone; no matter if they are three or seven feet long, put them all endways across the wall; then every time the kiln is burned three or four inches of the kiln will burn off as good lime as any in the kiln. Sandstone will color the lime and spoil it for perfect use. Build only one foot wide in the bottom for 16 inches high; then let it run wide when about six or seven feet high; it will be 10 feet wide and 13 long; then it is brought in again to about 9 by 11 on the top. The narrow place at the bottom is for a grate, where the ashes can be removed each morning. The grate is made of limestone, placed about three inches apart; over this is an arch for the wood two feet and six inches high. It will take from six to eight days to burn from two to three hundred barrels. This correspondent always burns with peat.

STEEL AND IRON WIRE ROPE.—Round steel wire rope will bear more than double the weight required to break iron wire rope of similar diameter.

GOOD HEALTH.

Care of the Hands.

Great care should be taken to keep the nails neat and well trimmed. They should be rounded at the top, and not too closely. Their polish and rosiness may be increased by brushing and rubbing.

To improve the skin of the hands and arms, take two ounces of Venice soap, and dissolve it in two ounces of lemon juice. Add one ounce of the oil of bitter almonds, and a like quantity of oil of tartar. Mix the whole, and stir it well until it has acquired the consistency of soap, and use it as such for the hands.

The paste of sweet almonds, which contains an oil fit for keeping the skin soft and elastic, and removing indurations, may be beneficially applied to the hands and arms.

For hands that are stained, there is an easy remedy. Dampen the hands first in water, then rub them with tartaric acid, or salt of lemons, as you would with soap; rinse them and rub them dry. Tartaric acid, or salt of lemons, will quickly remove stains from white muslin or lins. Put less than half a tablespoonful of salt or acid into a tablespoonful of water; wet the stain with it, and lay it in the sun for an hour; wet it once or twice with cold water during the time; if this does not remove it repeat the acid water, and lay it in the sun.

A most excellent ointment for hands that are scratched, burnt or sore, is thus prepared: Take three drachms of camphor gum, three of white beeswax, three of spermaceti, two ounces of olive oil—put them together in a cup upon the stove, where they will melt slowly and form a white ointment in a few minutes. If the hands be affected, anoint them on going to bed, and put on a pair of gloves. A day or two will suffice to heal them.

For chapped hands, instead of washing the hands with soap, employ oatmeal, and after each washing take a little dry oatmeal and rub over the hands, so as to absorb any moisture.

—*Illustrated Weekly.*

TREATMENT OF BEE STINGS.—A writer in the *American Journal of Microscopy* gives the following directions for the treatment of a bee sting, which are worth remembering: "Onions, ammonia, ashes, beef and a hundred other remedies have been prescribed, but we never found them of any special value. If the poison-bag has not been emptied, remove it with a sharp knife, or still better, with a pair of tweezers, so formed as to grasp the sting itself without pressing on the bag. Common hair tweezers are just the thing. This must, however, be done very quickly, or it will be of no use. Grasping the bag and sting with the fingers only squeezes the poison out of the bag and into the wound. After the bag has been removed suck the wound strongly and apply a poultice of moist mud. We have never found anything better."

Breathing Through the Nose.

There are various reasons for considering the nose the natural outlet of the lungs, and hence various advantages to be derived from breathing through the nose.

1st. If we breathe through the nose we will be enabled often to detect the presence of noxious odors in the air we breathe, and so be warned of danger in time to prevent it.

2d. The internal nose is studded with hairs, which in some degree at least prevent the ingress of noxious matters with the air we breathe. Dust is strained out, and it is confidently asserted by persons who have tested the matter, that miasmas are prevented from entering the blood if one breathes only through the nose. Some persons have lived in malarious districts, slept on the banks of malarious rivers, etc., for years, and yet have escaped all the forms of fever which usually followed a residence in the country, who have ascribed their exemption solely to the settled habit of breathing only through the nose.

3d. By breathing through the nose, little, if any, air passes into the lungs until it has come in contact with the membranes of the nose, which are supposed to possess some power of neutralizing malarious and contagious poisons.

4th. By drawing our breath only through the nose, the air is warmed by contact with the membranes before it reaches the lungs, and so inflammations and congestions of those organs are avoided.

Per contra, the habit, so common, of breathing through the mouth has many disadvantages. In this way a great volume of air is quickly taken in, loaded with dust, malarious or contagious impurities, etc., of which we are utterly unconscious, until the blood has been poisoned, and serious and perhaps fatal disease been inaugurated. The cold air being taken in in great volume and with great rapidity, chills the lungs, whereas, if breathed through the nose, it would be warmed before reaching the lungs.

The habit of breathing through the mouth is caused largely by weakness of respiratory muscles, and one excellent method of strengthening those muscles is to breathe through the nose. It is certainly as wise a plan as sucking air through a silver tube, so often recommended. Then breathe through the nose, as nature indicates, if you would have good health.

Eating—How to Keep off Dyspepsia.

It is an old German adage that "more people dig their own graves with their teeth than with spades," and verily it would seem so if we would look at the immense number of dyspeptics, rheumatics and gouty individuals, creeping through life in pain and wretchedness. Yet it is next to impossible to induce even thinking people to control their appetites, and to eat such things and at such times as nature shows them to be necessary and right. Dr. Hall declares, unhesitatingly, that it is wrong to eat without an appetite, for it shows there is no gastric juice in the stomach, and that nature does not need food; and not needing it, there being no fluid to receive and act upon it, it remains there only to putrefy, the very thought of which should be sufficient to deter any man from eating without an appetite the remainder of his life. If a tonic is taken to whet the appetite, it is a mistaken course, for its only result is to cause one to eat more when already an amount has been eaten beyond what the gastric juice is able to prepare. The object to be obtained is a larger supply of food; and whatever fails to accomplish that essential object, fails to have any efficacy towards the cure of dyspeptic diseases. The formation of gastric juice is directly proportioned to the wear and tear of the system, which it is to be the means of supplying, and this wear and tear can only take place as the result of exercise. The efficient remedy for dyspepsia is work—out-door work—beneficial and successful in direct proportion as it is agreeable, interesting and profitable. —*National Granger.*

Don't Worry Yourself.

To regain or recover health, persons should be relieved from all anxiety concerning diseases. The mind has power over the body. For a person to think he has a disease will often produce that disease. This we see effected when the mind is intensely concentrated upon the disease of another. It is found in the hospitals that surgeons and physicians who make a specialty of certain diseases are liable to die of them; and the mental power is so great that sometimes people die of diseases which they only have in imagination. We have seen a person seasick in anticipation of a voyage before reaching the vessel. We have known a person to die of cancer in the stomach when he had no cancer or any other mortal disease. A blindfolded man, slightly pricked in the arm, has fainted and died from believing that he was bleeding to death. Therefore, well persons, to remain well, should be cheerful and happy; and sick persons should have their attention drawn as much as possible from themselves. It is by their faith that men are saved, and it is by their faith that men die. If he wills not to die, he can often live in spite of disease; and if he has little or no attachment to life, he will slip away as easily as a child will fall asleep. Men live by their souls, and not by their bodies. Their bodies have no life of themselves; they are only resources of life—tenements of their souls. The will has much to do in continuing the physical occupancy or giving it up.

DOMESTIC ECONOMY.

How to Breakfast.

The *Sanitary Record* (English) sneezes our American custom of a substantial meal soon after rising, as follows: Let a healthy man really "break" his "fast" with a substantial meal, and not break his breakfast with irritating little nips or slops beforehand. After the stomach has at its leisure emptied itself during sleep of its contents, and sent them to repair the worn tissues and exhausted nerve force, and the blood has been ventilated and purified by washing and dressing with the window open, then is the time when the most perfect of all nutritive articles, farinaceous food, can be consumed in larger quantities with advantage. Butter also, and fat and sugar, troublesome customers to weak digestions, are then easily coped with, and contribute their invaluable aid to performing the duties of the day. For example, many persons can drink milk to a fair and useful amount at breakfast, with whom it disagrees at other hours. And the widely advertised "breakfast bacon" by its name warns the consumer against indulgence later on in the day. *Cafe au lait* and sweet, creamy tea are to many men poisonous in the afternoon, though in the prime of the morning they are a wholesome beverage to the same individuals. Let the vigor, good humor, and refreshment then felt by a healthy man be utilized without delay in eating a hearty meal immediately after he is dressed, and not frittered away in the frivolities of other occupations. Let not reading, writing or business—muscular, political or economical—exhaust the nervous system. The newspapers and letters should not be opened, preferably not delivered, till the appetite is thoroughly appeased.

Economy in Housekeeping.

In buying anything, be it groceries or cotton cloth, be not "penny wise or pound foolish." Some people with an honest desire to economize look well to the "spigot but forget to watch the bung." They spend hours running from one store to another to see where they can buy the cheapest, and if they get an article a few cents less at one place than has been asked them at another, they are in high spirits over their purchasing ability, never dreaming that they have, even at the price given, paid more than the article was worth! Some cannot discriminate fine flavored coffees from that of insipid or rank flavor. That being the case, a cheap article will answer their purpose just as well. Indeed many people educate their taste just to suit their purse—that is well. A man with a shun purse is better pleased and much happier if he have not a refined taste, as it is certainly an expensive thing to own; but if he have, better buy a little of a good article than a good deal of a poor one.

Nothing is ever gained by buying cheap articles, nor by changing your place of trade often. Trade at one place year after year if you can find a place to suit you. A store keeper soon learns to prize you if you prove a good cash customer, and will give you many liberal trades. I have known them many a time to even tell a good customer when there was going to be a rise in a certain article, and advise the purchasing of more than the usual stock. Transient customers never reap the benefit of any such hints, and then wonder why they cannot buy things reasonably. —*Germantown Telegraph.*

TIPSY CAKE.—Take a stale sponge cake, cut the bottom of it so as to make it stand even on a glass dish. Make numerous incisions in it with a knife, and pour over it half a pint of sherry and a glass of brandy; let the cake soak these all up. Blanch, peel, and slice some sweet almonds, and stick the cake all over with them. Blanch, chop, and pound in a mortar one-quarter pound of sweet almonds, moistening with a little orange flower water to prevent their oiling; add one pint of milk and the yolks of six eggs; sweeten to taste with powdered loaf sugar. Stir over the fire till the custard thickens, but do not let it boil. Keep stirring now and then till it is quite cold, then pour it round the cake. Garnish the dish with crystallized fruit, and it is ready.

EGGS AND MINCED VEAL.—The N. Y. *Times'* recipe for preparing eggs and veal is the following: Take some remnants of roast veal, trim off all browned parts, and mince it very finely; fry a shallot, chopped small, in plenty of butter; when it is a light straw color, add a large pinch of flour and a little stock; then the minced meat, with chopped parsley, pepper, salt, and nutmeg to taste; mix well, add more stock if necessary, and let the mince get gradually hot by the side of the fire; lastly add a few drops of lemon juice. Serve with sippets of bread fried in butter, round, and poached eggs on the top.

FRIED CAULIFLOWER.—Pick out all the green leaves from a cauliflower and cut off the stock close. Put it head downward into a saucpan full of boiling, salted water. Do not overboil it. Drain it on a sieve, pick it out into small sprigs, and place them into a deep dish with plenty of vinegar, whole pepper, salt and a few cloves. When they have laid about an hour in this, drain them, dip them in batter, and fry in hot lard to a golden color.



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DEWEY & CO., Publishers.

A. T. DEWEY, GEO. H. STONG
W. B. EWER, JNO. L. BOONEOffice, No. 224 Sansome St., S. E. Corner
of California St., San Francisco.

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We wish to thank those subscribers who send in their renewals to the Press promptly as regularly as the year comes round. It saves us much expense in commissions for collection and renewals. May we not request more of our good patrons to do so!

SAMPLE COPIES.—Occasionally we send copies of this paper to persons who we believe would be benefited by subscribing for it, or willing to assist us in extending its circulation. We call the attention of such to our prospectus and terms of subscription.

THE ORIGINAL ARTICLES in this paper are mostly set in solid type, giving in our columns one-third more reading than is contained in ordinary leaded matter.

Our latest forms go to press on Thursday evening.

San Francisco:

Saturday Morning, March 4, 1876

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THE EMMA mine business is being investigated by the committee on Foreign Affairs of Congress, Minister Schenck's connection with the business bringing it within their jurisdiction. So far, some very damaging testimony has been deduced, but Senator Stewart and Minister Schenck have neither of them yet put in their replies. They propose to answer in person shortly. The worst feature of it all is the testimony against one man well known in scientific circles, who is represented as having received a large sum for his favorable report on the mine. The whole business is a bad one, and reflects discredit on the American name—the guilty parties being men of prominence and wealth.

BOILER INSPECTOR.—We give in another column Pullen's bill on steam boiler inspection. We understand that the author of the bill and the San Francisco delegation wish for an expression of opinion from this city. We should be glad to publish the views of any of our readers who are posted on the subject, who have anything to say for or against the bill.

An Iron Furnace for California.

At last California is to have her first iron furnace. This, which is usually the first manufacturing enterprise of a new country where the material is found, seems to be almost the last to have started here. The reason of this is doubtless the greater attraction which the precious metals have had for the capital and energy of the State. The enterprise of Mr. P. Fitzhugh, an experienced iron master, has at length drawn attention to this source of wealth, and capital necessary to assure the completion of the works during the coming summer has been secured. The furnace will be built near Clipper Gap, on this line of the Central Pacific railroad, where a fine quality of magnetic iron ore is found in great abundance, and where also all other materials needed in the manufacture of charcoal pig iron are easily and cheaply accessible.

There is up to this time no iron furnace west of the Rocky mountains—except ones in Oregon—and all of our iron is consequently imported. Mr. Fitzhugh thinks that he has found a place that far exceeds any in the United States for making pig, bloomed and rolled iron of the best quality at the least cost anywhere known to him, and with cheaper transportation to market than any other iron beds in California.

The cost of making one ton of pig iron at the locality named is computed at \$20, as follows: Mining and delivering two tons of ore, to make one ton of iron, \$3; mining and delivering limestone (which costs the Portland, Oregon, furnace \$5), 25 cents; superintending and labor, \$3.75; charcoal, 125 bushels at 10 cents (many furnaces only take about 100 bushels, and it is delivered to the Oregon furnace for nine cents), \$12.50; repairs on furnace, making about 5,000 tons, \$2,500 per year (or per ton) 50 cents; total, \$20 per ton. The transportation from furnace to San Francisco is \$3.66 per ton, so the cost of working and delivering one ton of pig iron in this city is estimated as above at \$23.66.

According to analysis by Professor Price, of this city, this magnetic iron ore contains 62.44 per cent. of iron, and has no injurious ingredients that would in any way affect the quality of iron. The iron ore and limestone beds are large, rise nearly to the surface and can be quarried and delivered much cheaper than the cost to New York or Oregon furnaces, and the latter have to drift many feet under ground and transport their ores or limestone hundreds of miles. The ores are in the vicinity of an immense growth of wood, which can be easily and cheaply conveyed to the proposed furnace, and can be reduced to charcoal at any season of the year, and do not require to be collected in large quantities for winter supplies. It is stated that the ore will work the toughest iron, suitable for car wheels and steel rails. Professor Whitney, late State Geologist of California, in Vol. I., page 884 of his report, gives an account of the deposits of iron ore within six miles of Auburn, Placer county (the place in question), and says:

"It is in larger quantity than has yet been discovered in the auriferous slate series, cropping out on a side hill and forming a mass of more than thirty feet thick, of which the longitudinal extent is not known, although it is evidently considerable. It is hematite, appears to be of excellent quality and remarkably pure and free from intermixture with rocks. This locality is more favorably situated than any yet discovered in the State."

We understand that the amount of capital required in the business of starting this furnace for the first year is about \$75,000, and that all the arrangements have been perfected. We are very glad to know that at last California is to have an iron furnace and hope it will not long be the only one. The population of the State has increased so materially, and the demand for iron for various purposes is so great, that it is a pity to see so much money going out of California which could be saved within its borders and at the same time develop a new and profitable industry, both for capitalists and laboring men.

Our Engineering Department.

We commence in this week's issue of the Press a department of "Engineering," which we propose to continue and to make as interesting as possible for our readers. The term "Engineering" includes a multitude of subjects, all of them of broad scope, and we shall endeavor to obtain as much local matter as possible of every variety connected with the subject. To do this we need the co-operation of engineers and others interested, and urge those who have anything of interest to communicate, not to neglect to forward it to us for publication.

In mechanical engineering particularly, there are many among us well posted, who could furnish matter of great value, not only here, but elsewhere. We trust that they will aid us in making this department of local interest to engineers generally. If those who do not think they have time to write will simply suggest to us proper sources of information, we will hunt up all the details willingly. Although our people are all very busy during business hours, a

half hour in the evening occasionally will afford an opportunity of writing out whatever they have seen and interesting in this connection. We shall endeavor to make our Engineering Department take as much of a local character as possible, and to this end solicit contributions on any subjects connected with it.

The Dilatation and Expansion of Liquids.

Scientific Lecture by Father Neri.

Rev. Father Neri delivered the second of his course of scientific lectures for the present season at St. Ignatius college, on Tuesday evening last, on "The Dilatation and Expansion of Liquids by the Application of Heat." The Rev. Father, in his opening remarks, made a brief reference to the subject of his first lecture on "The Dilatation and Expansion of Solids," showing that the same cause produced the same effect on both solids and fluids, only in a greater degree on fluids, from the fact that they were more sensitive. This difference of sensitiveness grows out of the different molecular forces existent in the two classes of bodies.

In solids the attraction of cohesion is the governing force, repulsion being scarcely felt; while in fluids neither cohesion nor repulsion has any advantage, the molecules being perfectly free to move or expand. Still all liquids do not expand alike; for while one volume of water, advanced in temperature from 0 to 100° C., increases one-twenty-second in volume, mercury increases during the same advance in temperature one-fiftieth of its volume, alcohol one-ninth, the fixed oils one-twelfth, and ether and turpentine each one-fourteenth.

This varied expansion of liquids was shown by plunging into hot water flasks of various fluids, with tubes attached. The fluids were so colored as to make the elevation of the water therein, due to expansion in the flasks, perfectly visible to the entire audience.

A Disturbing Element.

The lecturer here called attention to the fact of a disturbing element inseparable from all such experiments in the expansion of the containing vessels as well as the fluids. That such was the fact to a very appreciable degree was beautifully shown by placing the tube connected with the flask, when in the act of applying the heat, in the path of an electric beam of light projected through a lens upon a screen, whereby the shadow of the movement of the liquid in the tube was greatly magnified. By that means it was plainly observable that a fall of the fluid occurred in the tube when the flask was first placed in the hot bath, due to the expansion of the glass before the heat was communicated to the fluid contained therein. This experiment was a very beautiful and most satisfactory one.

The Linear Expansion of Glass.

Was also shown by exposing to heat a glass rod having metallic caps on each end, so that its expansion was caused to close an electric circuit, by which a platinum coil, placed in an exhausted receiver, was made to glow with a red heat, and an electric bell to sound a note of alarm. The principle and effectiveness of the electric fire alarm was also beautifully illustrated by the employment of a column of quicksilver to form part of an electric circuit.

Several Other Interesting Experiments

Were made to show the expansibility of glass. The principle of the Bologna flask and Prince Rupert drops was also shown and explained; and the large amount of force generated in the explosion of the latter was demonstrated by exploding one of the drops in a glass vessel filled with water. The vessel was shattered to pieces, and the water scattered in every direction.

The Enormous Power

Due to the expansion of water was illustrated and dwelt upon at considerable length. The learned lecturer assured his audience that it would be easier to drive a nail into a block of steel than into a body of water subjected to great pressure, and so confined that no portion of it could escape. A power of 20,000 pounds to the square inch can readily be obtained from the application of a few degrees of heat to a vessel of water absolutely tight and able to sustain such an enormous power. The lecturer showed a large bombshell and a heavy quicksilver flask, both of which had been fractured by filling them with water and submitting them to a slight increase of heat. A power of enormous value, produced at a very slight expenditure of heat, may be generated in this manner. Although the movement must be slight, owing to its great force, it may be largely multiplied and possibly utilized in a practical manner. There may be great possibilities in this direction for future generations to work out. It is a subject worthy of the admiration and study of all. The lecturer remarked that we had heard much of late about

The "Keeley Motor."

Which was to revolutionize the application of power. No boiler, no heat, no expense, but yet an unlimited amount of power readily convertible to practical use. The secret could not exist in the dilatation of water, for that requires heat, and fully recognizes the correlation of forces, while Keeley utterly ignores all the established principles of science. The grand error on which so many excellent mechanics become wrecked, is the endeavor to create power.

The third lecture of the series will be delivered April 27th, the last Thursday of the month.

Bulletins of the Government Territorial Surveys.

The work done in the United States geological and geographical survey of the Territories, under Professor Hayden, is of great value and importance, notwithstanding the assertions to the contrary of persons who can see nothing but a "job" in everything undertaken by the government. A survey of this character can not, of course, do such accurate work as a coast survey, which goes over ground slowly and carefully and measures every inch. The Territorial surveys are only intended to be preliminary and general in their character, and so great is the extent of country which they are expected to cover, that prominent features only can be noticed and accurate detail left for future investigation after the ground work is finished. The publications of the survey are exceedingly valuable, giving correct ideas of the almost unknown localities which they describe, together with such scientific facts and deductions as are considered of utility. The corps of scientific men employed is not large, but their opportunities are such that they are able to publish a great deal of new matter more particularly valuable to scientists.

The publications of the survey comprise annual reports and bulletins, the latter containing more technical information than the former, which are of a general descriptive character. The Bulletin of the Survey was commenced in 1874, for the purpose of giving to the world more rapidly than through the annual reports the vast amount of new material which was constantly accumulating under the auspices of the survey, and in most instances demanding prompt publication. When the first and second numbers were printed it was not expected that it would continue long or be issued with any regularity; but its success was so great that it commenced the year 1875 as a regular serial, and six numbers have been issued of about 500 closely printed octavo pages, with 26 pages of maps, sections and other illustrations, with table of contents and full index. The table of contents has been prepared so that the numbers for 1874 and 1875 can be bound as Vol. I. During the year of 1876 the Bulletin will be continued. Most of the articles in the Bulletin will not be reprinted, especially the more technical ones; but those of a popular character will appear again in the annual reports, usually much enlarged and improved. The numbers already issued and distributed ought to be preserved, as several of them are out of print and will not be reissued.

A Divining Rod Expert.

A complaint has been filed in the Third District Court by A. Peck, against Michael Castle, in which he charges that, in 1872, he and Castle entered into a contract, whereby Castle agreed to pay his expenses to and from Virginia City, for the purpose of pointing out to P. Deidesheimer, at that time superintendent of the Ophir mine, where the ore body of said mine lay; and that if the ore body should be found after nine months of regular work in the course that Peck would point out as the course of said ore body, then he, Castle, would deliver to Peck 100 shares of Ophir company's stock at the price of \$50 per share.

The document on which this suit is brought is a peculiar one, and is in the following words: "San Francisco, March 2d, 1872—Michael Castle, on behalf of a party of gentlemen owning a quantity of Ophir company's stock, and having power to act for them, agrees with Mr. Peck to pay his expenses to and from Virginia City, for the purpose of indicating to the superintendent, P. Deidesheimer, where he asserts there is a body of ore. Should it prove, by future working in the direction Mr. Peck indicates, and when the work is done that may develop it, even only to show it is there, I, on behalf of the aforesaid gentlemen, and on my own security and distinct fulfillment of this agreement, will deliver Mr. Peck 100 shares of Ophir company's stock, at the price of \$50 per share, at his option, within nine months from this date. MICHAEL CASTLE."

Witness: A. H. Liska, Jr.

Peck, the plaintiff, alleges that he did go to Virginia City and point out to Deidesheimer the locality of the ore body, and that the work was for a time carried on as he directed it should be. But, he says, this was done for only a few months, and then the miners were taken from the proper course and made to work in another part of the mine, in violation of Castle's agreement with him.

The plaintiff then alleges that in the fall of 1874, the miners having been allowed to work in the course he had before marked out, the body of ore was discovered where he told Deidesheimer it would be; and that the new shares of stock advanced to and were worth on the market of San Francisco \$350 per share, making \$35,000 as the value of the one hundred old shares of stock he was entitled to have of Castle at \$50 per share. Therefore, he asks for \$20,000 in damages. "Professor" Peck is well known in Nevada, and considers himself an expert in pointing out ore bodies by the aid of the "divining rod," but whether he located the ore body referred to by this means, we do not know.

HOISTING machinery for sinking the new shaft of the Leo mine, on the Comstock, has already been ordered, and will be on the ground, ready for erection, in a very few days more.

Gems and Precious Stones.

(Written for the Press by HENRY G. HAWKS.)

(Continued from last week.)

The hydrostatic balance in use formerly was furnished with an extra pan with short supporting wire; a hook on the under side of the short pan served to support the specimen while it was being weighed in water; but an ingenious modern contrivance does away with the necessity of the short pan. Take any ordinary balance, the pans of which hang from the ends of a beam. Make a little stool, like a common bench, the legs being just far enough apart to allow the pan to rise and fall without touching them; the top of the bench must be at least an inch and a half wide. It must be placed across the left-hand pan and at right angles with its wire supports. The bench must be as low as possible to admit of the placing upon it a suitable vessel to hold water for the second weighing—as will be described. The vessel must be large enough to allow the specimen to hang in it without touching by at least half an inch on either side; a small ring is attached to the same hook which supports the pan, a very fine wire will also be required, which may be made of copper, or better, of platinum. This wire must be as fine as possible and each end bent into the form of a hook, a fine thread of silk or a horse-hair may be used instead of the wire; but they will be found more difficult to manage. When all is ready the little bench is placed in position and the vessel to contain this water is placed empty upon it. One end of the wire is passed around the specimen and hooked. The other end is hooked into the ring at the end of the beam. If all has been properly arranged, the specimen will hang from the beam into the empty vessel without touching it. Weights are then placed in the other pan until the beam is in equipoise. These represent the weight of the specimen in the air. A memorandum of the weight is made, and distilled water is poured gradually into the vessel until all parts of the specimen are covered. Some little time must be allowed to elapse before the second weighing is made. This is to give time for air bubbles to form, in which case the specimen must be removed from the water and its surface touched gently with a soft brush. When it is replaced in the water no more bubbles will appear, and the operator may at once proceed with the second weighing. The specimen will be found to weigh less than it did in the air. The second weight is noted, and from the data so obtained the specific gravity may be calculated.

The weight of the specimen in water must be subtracted from its weight in air, which will give the loss or the weight of an equal volume of water, and by dividing the weight in air by this loss, the specific gravity is ascertained.

An example will furnish the best illustration:

Suppose the weight in air to be 40.36 grms.
" " " " water " 27.08

Loss, or equal volume of water, 13.28
Then—
40.36
— 13.28
— = 3.039 specific gravity.

Another method of determining specific gravity and of great use to gem hunters, is the "specific gravity bottle." But its use necessitates the having distilled water and a very sensitive balance. More than one of these bottles will be required. Small stones must be weighed in small bottles and vice versa. Suppose a case: Let it be required to determine the specific gravity of a stone the size of a pea. A bottle with a sufficiently large mouth and holding the least quantity of water to cover the specimen should be selected. The bottles must be chosen with great care. They should be provided with glass stoppers, rather long and well fitted to the neck. In all cases the stoppers must be weighed with the bottles. The bottles should be without flaws, and should be specially examined on the bottom to see if that part which is attached to the tube in blowing is smooth, and that small fragments of the glass are not likely to be broken in using, in which case the weight of the bottle would be less unexpectedly, which would lead to mistakes. With a sharp file, a little channel must be cut lengthwise of the stopper, to allow any superfluous water to escape when the stopper is placed in the mouth of the bottle brim full.

A counterpoise must be made the exact weight of the bottle. Before this is adjusted the bottle must be wiped dry and clean both outside and inside. The counterpoises may be made of lead, hammered into a cube; when nearly correct, place the clean and dry bottle in one pan of the balance and the counterpoise in the other, then by scraping with a knife remove the excess of metal until the weight exactly corresponds with that of the bottle. Then reverse them, that is, change the weight to the pan which before held the bottle and the bottle of the other. If they still seem to be correct, the balance is in adjustment, and you may expect correct results. If not, care must be taken always to weigh the bottle in the same pan, by which precaution nearly all the errors of the balance may be avoided. When all is

ready return the bottle and counterpoise to the proper pence and see if they again balance each other; remove the bottle, fill it full of distilled water, replace the stopper, carefully pushing it down hard, wipe it dry with a clean cloth, and examine it to see if it is full of water, and that there are no air bubbles around the stopper; now put weights in the pan with the counterpoise until the beam is again in equipoise; write down the weight of the water and mark it "A." Pour out the water, wipe the bottle dry and clean inside and outside, and again place it in the same pan of the balance, drop in the stone and weigh again; mark this quantity "B."

(To be Continued.)

Seymour's Cotton Planter.

We print on this page this week an illustration of an improved cotton planter, invented by Pierpont Seymour, of East Bloomfield, Ontario county, New York. It is the result of many experiments in testing various devices for distributing cotton seed (and also fertilizers) by machinery. It is claimed that its action upon cotton seed, is such that it will distribute the seed so as to secure a continuous discharge from the hopper into the ground, in the same manner as a good grain drill will distribute wheat and oats. Should it be desirable to moisten the seed and mix it with fertilizers, it will in no wise hinder the operation. The



SEYMOUR'S COTTON PLANTER.

machine may be made broad enough to plant three rows at a time, and yet not be too heavy for one horse, and when made to plant but two it is light work. It plants the rows three, three and a half or four feet apart, and may be so made as to plant them any desired distance. The teeth for planting action are easily removed, and as many cultivator teeth substituted as to fill the entire space between the teeth, thus converting the machine into a very desirable and efficient cultivator. These teeth are especially adapted to this machine, and attached to the "drag bars" in the same manner as the teeth for planting. They set in double rank to prevent clogging, and can be so ganged as to run shallow and just shave the top of the ground, or to penetrate to a depth of six inches. When deep cultivating is required, a pole is used for two horses, and by removing the two middle teeth, two horses may be used to cultivate young cotton or corn, by straddling the row; and when one horse is used for this purpose, the two outside teeth should be removed. Whether planting or cultivating, the whole is under the entire control of the driver as he sits in the seat.

The whole of last week was expended on the Hale & Norcross mine in hoisting and pumping water, with no visible effect toward a reduction of the body on the lower levels of the mine.

A WORKMAN in the Washington mine at Hornitos, named Williams, was hanged under twenty-five feet of earth by a cave last week, and at last accounts his body had not been recovered.

The San Jose woolen mills have still so large a stock of goods on hand that it has been determined not to resume operations at present. The mills have been closed two months.

Card from Mr. Fryer.

EDITORS PRESS:—I feel in duty bound to respond to some of the recent attacks upon the Fryer process, though it is better to avoid, generally, any contest with persons not governed by gentlemanly principles, especially if such persons have little or no knowledge of the subject they attempt to discuss.

Rossiter W. Raymond, author of the articles in regard to this process which have been so generally quoted here and elsewhere, is as far a sample of this class of persons as I ever had the misfortune to meet while innocently progressing with a mechanical or chemical subject.

In the article in the *Mining and Engineering Journal* of January 15th, he shows the qualities of an unfair pugilist who strikes an unguarded person and then challenges him to fight. Mr. Raymond first attacked my preliminary process with ridicule, criticized the business management of the company, sneered at local accounts of my success, and then wound up by saying, "I pause for a reply."

It was not necessary for me to reply. A hundred ready pens would have contradicted his statements, had I allowed it. As it is, a few items appear to satisfy the public that I am not a common liar or swindler. In answer to all such items, Mr. Raymond simply asserts

men, work to their satisfaction like the fruit of my humble endeavors has, and you will not find me at your back with a dagger, but faithfully rendering you every assistance—not for your personal benefit, but for the sake of our impoverished country.

Mr. Raymond says: "Processes heralded with glowing but mysterious announcements, as revolutionizing the art of metallurgy, are usually swindles. Mr. Fryer's enterprise having been unfortunately attended with some of these features, we took pains to say that we did not rank it in that class." For this I am thankful, and regret that Mr. Raymond had not given me notice before publishing his first criticism. I would have been as open with him on this subject as with any gentleman here who has been taken into my confidence. Then, if he had chosen to condemn the process, we would at least have been evenly balanced as regards knowledge thereof. But returning to the above quotation, I would inform Mr. Raymond that the publicity given to the Fryer process is due to the press itself, and was unsolicited by me. I appeal to every editor in this State, or in the United States, to answer if I have ever asked one of them to publish anything in favor of my process until after it had gained a wonderful newspaper notoriety, when I wrote some cards over my own signature to correct erroneous descriptions, and also to quiet the excited people who were bent upon returning to certain deserted districts to regain their fortunes where they had lost them, because my process had been reported capable of working ores once refractory. I could easily have ended the swindle here, had it been such, by a course too apparent to mention.

Some of the iron men in San Francisco, even before the issue of any part of my invention, declared that at an expense of \$1,500 they had procured copies of my case, and that it was a failure.

I know no reason for this unless it is because some of them have suffered through the fact that a great many mining men were waiting for me to furnish them with our kind of apparatus, while on the contrary I have advised nearly everybody who had properly not to wait for me; that they could perhaps build a mill and pay for it before we were ready to supply them. Again, Mr. Raymond refers to an assay made at Virginia City of a piece of bullion produced by our process. I can only answer that I know not its contents or character until after the assay was made. The amount of the ore tested was 18 pounds as stated, for the reason that the gentleman who brought the ore had no more of the same character. But here let it be understood that some of our charges amount to four tons, and the more of them that we run, the more regular works the apparatus. Now, in regard to the purity of bullion produced, especially silver, he it understood that I do not allow every result above 900 fine, though in many cases such it is.

I have been censured for not issuing my patents more rapidly, that people may have a chance to criticize the claims thereof. There would be no objection to this, were it not for the reason that such patents would be as apt to fall into the hands of unprincipled novices, who, when finding something that is not laid down in books, preclaim: "We have found something wrong, or else we don't understand it, therefore there must be some swindle about it." Now, as my patents on this account will be issued as slowly as possible, let me entreat everybody to withhold criticism until after the whole case is made public.

In this connection, though I will not be unkind enough to challenge Mr. Raymond to visit my works and find something in metallurgy which he has never before seen, I will say in all earnestness that should Mr. Raymond at any time visit this part of the country, I will open to him my works, and do all in my power to make his trip a pleasant one.

In conclusion, permit me to express my sincere thanks to the correspondent of your paper of the 26th ult., for his gentlemanly criticism of the Fryer process, which he was willing to stop at the point where his knowledge of the process ended. Whether right or wrong he shall one day have a chance to satisfy himself, as I wish it to be fully understood that I will, as soon as possible, invite everybody interested in these matters to visit these works. With this assurance, I remain,

Very respectfully yours,

ROBT. M. FRYER.

Grass Valley, March 1st, 1876.

In the South Comstock mine water has so increased that the mine is flooded like the Savage, and the machinery is totally incapable of reducing or managing it at all; consequently, work is suspended for the present, until the management shall decide what course to pursue.

The snow near Yreka is so deep that the roads are impassable, and travel has been entirely suspended in some directions.

MINERS are leaving Gold Hill and Virginia almost daily for the Black hills.

The Coso Mines.

A correspondent of the Kern County Courier gives his general impressions of the Darwin country as follows:

I have been in Darwin several weeks, a quiet looker on, never obtruding, nor suspiciously inquisitive, and have visited most all of the mines that are in successful operation, those being developed and those having but a name and an owner. Of those being worked and having furnaces producing bullion, I need not specially speak. I wish to enumerate, for the benefit of my friends, some of the mines not yet brought before the public. I will do Darwin district first. The Defiance, New Coso and Cuervo, each have furnaces in operation and are producing large quantities of bullion, the latter furnace, at this time, running a contract for the Coso Consolidated company, which company owns the Bella Union mine. The New Coso furnace is running on ore from the Christmas Gift and the Lucky Jim mines. I will now mention the Cuervo and Grand mines, on a line north of the Defiance, both giving promise of developing into good mines. Continuing north and a little west, is the Union, a mine with some fine looking ore on the dump. This mine is but a few hundred yards on a direct line with the Bella Union. About one mile from the Bella Union is the Independence mine, which shows well in a shaft now down to quite a depth. Just south of the Independence is the Blade mine, with a hole sunk on it sufficient to show a good body of mineral, which assays quite well for a surface prospect. The mines mentioned in the foregoing are located north of the town of Darwin. Going east of town I found, first, the Benham mine, one of the best defined locations in the district, having fine croppings, and from ore taken from the shaft sunk upon it good assays have been made. East of the Benham is the Falcon, undeveloped, but similar in appearance on the surface to the Benham. Farther east lies the Keystone, a mine developed sufficient to show good mineral. South of town, or rather southeast, lies the Norton mine, with a shaft sunk to a good depth and showing mineral in encouraging quantities. Further south is the Arambula, having on the dump quite a large pile of fine looking ore, owned by Mexicans. And continuing in a southeasterly direction I came to the Santa Rita, with a big hole in the ground and a large pile of ore on the dump, owned by Mexicans. This mine is destined to soon make a good report in our camp.

Leaving Coso district, (Darwin) I took a trip one day to Lookout district, 10 miles southeast of Darwin. In this district I visited the St. George, a gold bearing ledge, which contained fine free gold and sulphurets in almost every piece I broke from the croppings. This is a big mine—it can be traced by outcroppings for the distance of three or four claims, say 5,500 feet. Parallel with and just south of the St. George mine is the Lighthouse mine, having the general characteristics of the St. George, and fully as easily traced on the surface. On this ledge are several locations. Further east, and near the west side of Panamint valley, and on a line with the St. George, is the Ida mine, one of the best situated locations in that neighborhood, and gives promise of assaying as well as the St. George or Lighthouse. I looked at other locations in the neighborhood of the above mines, but did not get the names of them. That portion of Lookout district which I visited is a gold producing belt, being in granite formation—just such an appearing country as an old quartz hunter would look for to find gold bearing ledges. North of the claims mentioned here, in Lookout, are the Minneatta and Modoc. You will remark the absence of the names of the owners of the mines mentioned. I know but few of them, and to mention them would serve no purpose of this letter. I have simply mentioned mines which are destined to develop into paying ones. Many of them are now in the hands of poor men, and consequently development must be slow. I have met some owners of mines here who, while in conversation with them, would remark, "I hope nothing will be said about my mine until I get it open, so I can show something." That is the right view to take of the matter. Hoping this general view of the undeveloped and unknown mines may satisfy you until I can select and make special mention, believe me to be yours, truly.

A Miners' Clothes Room.

The Virginia Chronicle says: When the Consolidated Virginia works were reconstructed every department received equal attention, and the works are now as convenient and complete, for all purposes, as experience and money could make them. The miners' clothes room—an apartment sixty feet in length over the ore gangway—is for the special benefit of the men when they come out of the mine. They are then of course wet to the skin and much overheated. Making their way at once to the drying room, they take off their wet clothes and don dry ones. The room is thoroughly heated by an immense stove eight or ten feet long, surmounted by a huge sheet iron drum. The miners hang up their dripping working suits around the walls and across the room in all directions, and leave them there to steam and dry. When they have dried the windows of the room are thrown open, the accumulated vapor is allowed to escape, and then it is heated up for the next shift of wet workers. The room presents a remarkable appearance at all times.

A dealer in old clothes would view it with appreciative delight. The honest miner is not particular about the cut or condition of the garments which he wears in the lower levels. As long as they will hang on his shoulders and around his hips he is satisfied; and as to the hats which are worn in the presence of the bonanza, they are something fearful and wonderful to behold. They might be hung in a row in the most exposed hallway in the city and all the sneak thieves in Virginia might pass them in procession. The hats would be safe. The brogan of the miner is also more for use than for ornament, and could, if required, be used as a club with fearful effect. It is proposed to have at the Centennial Exposition at Philadelphia a collection of the different styles of garments worn in America from 1776 to the present day. If this idea shall be carried out, by all means let a hundred units be selected from the drying room of the Consolidated Virginia and sent on.

The Imperial Consolidated.

As there is now a good deal of talk about the proposed consolidation of the small Gold Hill mines, under the title of the "Imperial Consolidated," and as many are desirous of knowing about how the new shares should sell, a short review of the situation may not be out of place here. The consolidation, as we understand it, is to include the Imperial, 183½ feet; Empire mill and mining company, 75 feet; Bacon, 65 feet; Eclipse, 70 feet; Trench, 20 feet; Bowers, 20 feet; Gold Hill Quartz, 34½ feet—making a total of 468 feet. We understand the new arrangement will be represented by 500,000 shares, of which 200,000 are given the Imperial and Empire mill for their shaft, in the proportion of two-thirds to the Imperial and one-third to the Empire. The other 300,000 shares are then divided pro rata between the whole seven claims which are consolidated. This gives to the several claims the following shares: To the Imperial, 251,069; Empire, 114,744; Bacon, 41,666; Eclipse, 44,872; Trench, 12,820; Bowers, 12,820; Gold Hill Quartz, 22,009; total, 500,000 shares—an increase on the old stocks of these claims in the following proportions: Imperial (100,000 old shares), 2 51-100 for one; Empire mill (50,000 old shares), 2 29-100 for one; Bacon (25,000 old shares), 1 67-100 for one; Eclipse (25,000 old shares), 1 79-100 for one; Trench (5,000 old shares), 2 56-100 for one; Bowers, (5,000 old shares), 1 1-10 for one. In the foregoing we have not added the decimals to make it entirely exact, but it is within a fraction of right. The 468 feet are divided into 1,068 44-117 shares per foot. The old shares sold recently as follows:

Imperial, 100,000 shares at \$10.....	\$1,000,000
Empire, 50,000 shares at \$6.....	300,000
Bacon, 25,000 shares at \$5.....	125,000
Eclipse, 25,000 shares at \$5.50.....	137,500
Trench, 5,000 shares at \$5.....	25,000
Bowers, 5,000 shares at \$5.....	25,000
Gold Hill Quartz, 20,000 shares at \$3.....	60,000
230,000 shares for.....	\$1,702,500

Which is an average of \$7.27 per share. Seven dollars and twenty-seven cents per share for the 230,000 shares is equivalent to \$3.34½ per share for the 500,000 new shares, and is about the figure at which the new shares should start upon the market.

THE GOLD HILL MINE.—A correspondent of the Idaho Statesman says: The mill has run constantly since it started up, though for a few days last week it appeared doubtful whether ore enough could be obtained, in the present undeveloped condition of the mine, to keep it running. The closest game, however, has been played, and henceforth the facilities for extracting ore will increase daily. The company have a force of 48 men employed at present, including engineers and their very efficient foreman, W. H. McIlvin. Stopping operations, which were for a time suspended in the new levels, have again been resumed and under very favorable auspices. The ledge at the point where work is now being prosecuted is badly broken up, the formation reaching a width of 20 feet and upwards in places, while the vein carrying the entire wealth of the mine varies from a few inches to three or four feet. It is possible, and even probable, that at a greater depth all this ledge matter may unite in a well defined and gold bearing vein. If this proves to be the case, and the theory that it will is well grounded, I believe then Idaho can justly boast of one permanent and valuable institution, and Gold Hill will take rank with the famous mines of the coast. The financial countenance on this side the basin is wearing a more promising look than at any time during the past eight months.

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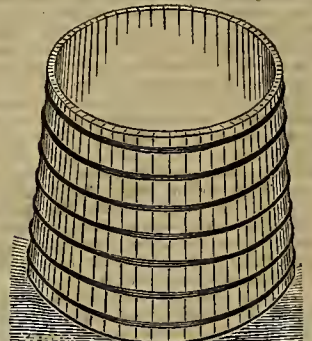
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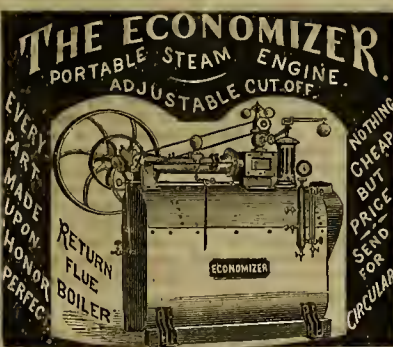
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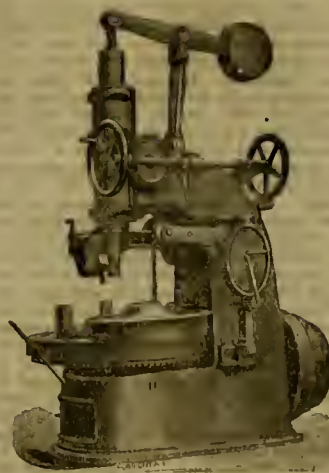
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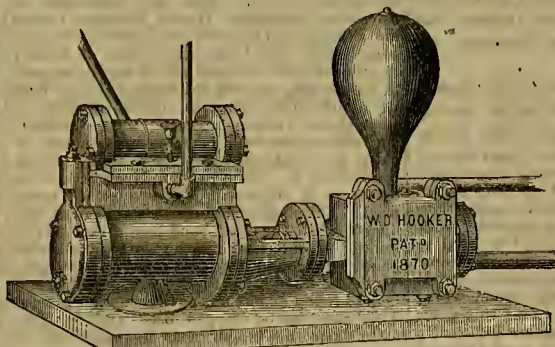
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(Continued from Page 149.)

righted. Things are now working smooth, the usual shipments of ore taking place and the ore on the 8th, 9th and 10th levels pulps about the same as our former reports.

Arizona.

SELLING MINING GROUND BY LOTTERY.—Arizona Miner, Feb. 22: It is a conceded fact by all who have examined the ground that the Peck series is the richest mineral belt known to silver miners. The Peck series has been worked to any extent has afforded evidence, and is still maintaining this reputation, and doubtless many who read this and who know the character of the ledges will be astonished at the announcement that a portion of it is offered by lottery or otherwise, and yet it is true D. S. Lount, Esq., who, with Geo. Opydyke, owns the first South extension, both of the Peck and Occident of this series, has determined to close out his interests in Arizona with a view to going back to California to reside. He therefore offers his one undivided one-half interest both in the Chandler claim on the Peck ledge adjoining the Peck claim on the south, and in the General Kautz claim, which adjoins the Occident on the south, and is an extension of the ledge of that name, which is one of the Peck company's locations. The Peck taken from the Chandler and General Kautz claim, we are assured is precisely similar both in appearance and richness by assay to that taken from the discovery claims, of which they are adjoining extensions. Each of these claims contains 15,000 feet, in which Mr. Lount owns an undivided one-half interest—750 in each, or 15,000 feet in all, which he offers to dispose of in \$10 chances. There will be 150 tickets sold, and the highest number drawn will entitle the holder of that ticket to Mr. Lount's interest in both these valuable mining properties. Parties desiring to learn of the title are referred to the county records. They were both located on the 25th of June, 1875, and recorded on the 12th of July, 1875. The assessment work is all done until a year from the 25th of next June, and no adverse claimants to the property.

Colorado.

COOPER ON BEAR CREEK.—Denver Tribune, Feb. 23: The Malachite copper mine, located near Bear creek, four miles above Morrison, is being successfully developed by the Malachite mining company, and under the supervision of W. H. Chapman. This company is principally composed of Boston capitalists, has plenty of means at command, and sufficient knowledge of the business to avoid serious losses, which in Colorado mining proceed mainly from ignorance. The ore of this deposit, between walls, is some 23 feet, and the pay vein, so far as exposed, averages two feet in width, and is largely made up of red oxide of copper, with a fair quantity of the native material. At the works in Boston, where the ore will be treated, it will sell for some \$300 per ton, no allowance being made for the small quantities of gold and silver which this ore is known to contain. The owners are constantly engaged in the development of the mine, and they are raising an average of two tons per day. When this ore can be treated to advantage in Colorado, the profits of the mine will be largely increased.

THE RABBIT EAR SILVER MINES.—Boulder News, Feb. 19: Aware that many readers are depending on our paper for information respecting the silver mines of the mountain range which separates the Malachite and North Parks, we have endeavored to give all reliable information from that section. This is called the Rabbit Ear range, because from a distance its two prominent peaks have the appearance of the ears of a rabbit—a high rabbit, say the father of all rabbits, as the Irishman said of the jack. Where this range, coming from the west, strikes the main range, it "puts a tail on it," and the range is long as the Malachite mines are westerly from Long's Peak perhaps 30 miles, and northerly from Grand lake 15 miles. Of the older mining camps, Caribou is the nearest and the best outfitting point. Last summer three camps were founded there, the Campbell, Baker, and Pollard, the last being on the slope toward the North Park, and the two first named near the summit of the divide, and above timber line. The ore is much the same as the Georgetown silver ore, and, though 70 miles distant, will be shipped there for treatment; and it will bear the transportation till such time as mills are erected in the vicinity. The veins are of the large, strong class that produce a great deal of ore. Of its value so many tests have been made, both of samples and in bulk, that there can be no more question about it. By our visit to that region last August, we were convinced that it will prove one of the very richest of our silver regions. Within three years it is pretty safe to say there will be a stage line and telegraph from Caribou to Grand lake, connecting with a line to Georgetown, and also a line to Larimer City; and extensive silver mills will be erected in the immediate neighborhood of the mine. It is not impossible that a more direct road from this section to Grand lake may be had by crossing the range at the head of one of the forks of the St. Vrain. The exploration of that region is but just begun. Of those who went in there last season, most acquired property which they regard as a fortune, and about much of it there is no mistake. There are thousands of veins yet unclaimed there, and many fortunes will be secured next season.

Idaho.

NO WORK.—Idaho Avalanche, Feb. 24: Miners abroad who may be contemplating coming here in search of employment are recommended not to take this step at present. The labor supply here now is so large that the demand, and there still quite a number of workmen here unemployed. When spring opens there will probably be a change for the better.

SOUTH MOUNTAIN.—James Norton, assisted by Hugh Norton and R. M. Martin, has commenced work on the Robert Emmett. I went into the tunnel this morning. It starts on the lode and runs 30 feet before crossing it, for which distance there is a good haul on the lode on both sides of the tunnel, overhead and underneath. The pick cannot be struck in the walls or top or bottom without pulling out galena ore. They are now commencing to sink down on the lode and will be taking out good ore from the start.

H. KURRY and William Pierce will commence tomorrow to sink on the Dave Johnson mine, belonging to Messrs. Boyer & Butcher. The shaft is 30 feet deep to start with and the ore looks well.

T. J. VERTON continues to run his tunnel for the Polar Star lode and will tap it in the course of another month.

The Hastings Bros., with Patrick Heaton and Belmont Oontemache assisting them, continue operations on the Hastings mine. They have tapped the ledge in the west tunnel, which is six feet below the top of the ledge and the ore as good as they did above. These are the only mines that are being worked just now, but the Robie was taking out ore all winter until the last few days, and will resume a few days hence.

There is considerable hope that business will be revived ere long. If the South Mountain Consolidated Mining company's furnace can be leased, it is a settled thing that business will go on, and it seems only a pity to let them stand idle when by using them all here would have a chance to earn their living.

A BONANZA IN ALTURA COUNTY.—Idaho Statesman, Feb. 24: Geo. Newton, Judge Heath and Mr. Hogan, the owners of the Last Chance ledge at Atlanta, made one of the richest strikes on record in their mine last week. From five to six pounds of rock the size of the unparalleled sum of \$400, gold. If such a mine as this was situated in California or Nevada millions of money would be offered by capitalists to develop it; and the day cannot be far distant when the mountains of Altura county, which are ribbed and seamed with gold and silver, will command the attention of the world. From five to six pounds of rock the size of the unparalleled sum of \$400, gold. If such a mine as this was situated in California or Nevada millions of money would be offered by capitalists to develop it; and the day cannot be far distant when the mountains of Altura county, which are ribbed and seamed with gold and silver, will command the attention of the world. From five to six pounds of rock the size of the unparalleled sum of \$400, gold. If such a mine as this was situated in California or Nevada millions of money would be offered by capitalists to develop it; and the day cannot be far distant when the mountains of Altura county, which are ribbed and seamed with gold and silver, will command the attention of the world.

Montana.

MINING PROSPECTS.—Helena Independent, Feb. 20: The prospect for good mining season the present year is as bright if not brighter than for a number of years past. There is some apprehension that the water supply will be short in many localities, as the usual quantity of snow has not yet fallen, and weather prophets predict that it will not. If these predictions are verified, and no rain falls in the summer, the yield from the placer mines will be somewhat reduced from that of last season, but the yield from quartz—both gold and silver bullion—will be far in excess of that of any previous year in Montana's history. There is much greater activity now in the erection of machinery and the development of lodes than ever before known, and these developments indicate the existence of large quantities of very rich ore.

BUTTE.—Mr. Ben. Ezekiel, who returned from Butte last Monday evening, brings in some items from that promising camp. The Centennial mill started last Thursday for the purpose of testing the working of the machinery, which was found to perform admirably. The miners of that district promised Mr. How a bonus of 200 tons of first-class ore as an inducement to locate his mill at Butte, and it is said that the yield from this ore will pay for the mill. The first installment from the lode of Prof. W. Egbert Smith has already been delivered to the mill, and is now being reduced. The arrangement concluded between Mr. W. A. Olark and Mr. Farlin is giving satisfaction to all interested, and it is conceded that it will result favorably to the interest of mine owners in that locality. The Farlin mill will be in good working trim in April. The Poznański Brothers are owners of a valuable mine with a two-foot vein of ore containing gold, silver and copper. They are taking out considerable ore, which will readily sell at \$60 per ton on the dump. Morris Brothers have a fruit and variety store there and are doing a good trade. The population of the camp has greatly increased, and the Black Hills excitement is at a discount there. Mine owners are greatly elated at the prospects of the early development of their mines, and judging from present indications, their anticipations are extremely well grounded.

PATENTS & INVENTIONS.

A Weekly List of U. S. Patents Issued to Pacific Coast Inventors.

FROM OFFICIAL REPORTS FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.

By Special Dispatch, Dated Washington D. C., Feb. 29th, 1876.

FOR WEEK ENDING FEBRUARY 15TH, 1876.

PANTALOONS AND OVERALLS.—Hermes Adams, S. F., Cal.

WINDMILL.—Owen T. Davis, Brighton, Cal. MEANS FOR CONVERTING BREACH LOADING RIFLES INTO MUZZLE LOADERS.—Charles D. Ladd, S. F., Cal.

ZITHERS.—Friedrich Langmaak, S. F., Cal. TRAPS FOR ALCOHOLIC PANS AND SETTLERS.—Almarin B. Paul, S. F., Cal.

FEATHER DUSTER SUPPORTER.—Jacob Unna, S. F., Cal.

PROPELLING CANAL BOATS.—Louis F. A. Le-gouge, Wheatland, Cal.

COMPOSITIONS FOR PAVEMENT.—Daniel Richey, Napa, Cal.

SCREW PROPELLER.—F. H. B. Babbe, Antioch, Cal.

MEAT CURING APPARATUS.—Wm. K. Dietrich, S. F., Cal.

CHEMICAL HOT-AIR OR VAPOR BATHS.—Abram M. Loryea, S. F., Cal.

TRADEMARK. LARD OIL.—Whittier, Fuller & Co., S. F., Cal.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of mention:

IMPROVED ZITHER.—Frederick Langmaak, S. F. This is an improvement in that class of instruments known as zithers. The instrument, which the inventor calls a "vocal zither," instead of having a large sound board with strings stretched across it and so constructed that it must lie on a flat surface, is made with a smaller sound board, and is provided with two posts or standards to support the head or wrist-bar which receives the turning pins. One of these posts forms the handle, and is provided with frets. The strings upon which the piece is to be played extend over this post, while the accompaniment strings are sufficiently separated to allow the fingers to grasp the neck and manipulate the strings above it without interfering with the others.

ATTACHMENT FOR BREACH LOADING RIFLES. Chas. D. Ladd, S. F. The object of this invention is to provide an attachment for breach loading rifles, by the use of which the breach loader can at any time be converted into a muzzle loader, with a convenient mechanism for removing exploded caps. Among the objections to breach loading rifles are the expense of the cartridges, and the uselessness of the piece if the hunter should exhaust his peculiar ammunition when at a distance from supplies of it. Another great trouble is that the fixed ammunition for breach loaders is usually made with heavy charges of powder and heavy balls, fitted for the largest game, but which would utterly destroy small animals or birds, besides making a very disagreeable recoil. In order to overcome these objections the inventor constructs a tube, having its exterior shaped precisely like a cartridge, so as to fit perfectly in the chamber of the rifle. In the front of this cylinder a small chamber is made, similar to the chamber of muzzle loading rifles, and this chamber has a passage extending back to the

nipple, which occupies the same position the anvil does in the ordinary central fire cartridge. As a percussion cap is used in this tube as in muzzle loaders, it is necessary to remove this cap after exploding. In order to do this, Mr. Ladd surrounds the tube with a loose ring, and a spring latch arm extends outward until its head is in such a position as to be caught by the retractor and drawn back with it. This action removes the cap from the tube, when the ring is stopped by striking a pin in the side of the tube. The continued movement of the hammer causes the retractor to slip past the latch, which, with the ring, will slip back so that a new cap can be placed upon the nipple. When the hammer is let down to its place the retractor will slide past the latch, and again be in readiness to withdraw a cap after the rifle has been fired. The charge of loose powder may be as large or small as desired, and can be inserted from the muzzle. The ball may be patched and seated by means of a ramrod in the usual manner, so that for such small game as hinds, squirrels, etc., a light charge of powder and a small round ball can be used, while the fixed and more costly ammunition can be reserved for larger game. The attachment can be readily seated by pressure at any time, and may be removed by forcing it out with a ramrod.

WINDMILLS.—Owen T. Davis, Brighton, Sacramento county. This invention relates to improvements in that class of windmills in which two wheels are mounted upon opposite ends of the same axis, and the improvements consists in a novel means for regulating the mill and throwing it into or out of the wind. In order to do this it is necessary to employ a tail, which stands at right angles with the wheel shaft, being mounted in an arm so that it can rotate upon its axis. A crank is made at the end of this axis and a suitable connecting rod leads to the lever below the arm. This lever is pivoted near its center and a weight is suspended from the end of it so that it will force up the opposite end of the lever and through the connecting rod act upon the crank and thus retain the tail in a horizontal position. From the middle of the lever an arm extends upwards, and has the double winged tail attached to it. This tail has two leaves shaped like the shaves of a plow, flaring out at the top and having their front edges joined. The operation will then be as follows: During any ordinary breeze the wheel will stand to the wind, and the tail will lie horizontal. Whenever the wind increases to a gale it will act upon the side of one of the flaring wings in the manner of a propeller and thus force it back. This forces the lever down and through the connecting rod operates the crank and thus turns the tail so as to present its flat side to the wind, which will then force it around until the wheels are carried out of the wind. When the wind abates the weight will act to partially or wholly overcome the action of the wind upon the inclined wings and thus turn the tail so as to again allow the wheels to be brought into the wind.

FEATHER DUSTER PROTECTOR.—Jacob Unna, S. F. This invention relates to a device to be applied to feather dusters for the purpose of preventing the outside feathers of the duster from spreading and being broken when the duster is introduced between articles of furniture, or in small spaces. When the outside feathers of feather dusters are allowed to straggle out in every direction, the appearance of the duster is spoiled. It soon becomes ragged and broken, and its work as a duster is not accomplished. Mr. Unna uses a band of leather or other suitable material, which is large enough to pass loosely around the feather duster near its middle and confine the outside feathers to their place without crowding them together. An India rubber band is made small enough to clasp the head of the duster tightly when drawn over it. Then two bands are connected by means of stays or braces, two usually being used. The elastic band clasps the head of the duster, while the other band passes around the middle of the feathers, the springy metallic bands connecting the two. The device prevents the outside feathers from spreading and being broken or lost out of their proper places. The bands can be slipped back and forth, so as to clasp the broom near its extremity or close to its head. This device is not a clamp, but a loosely fitting band, and is in no way similar to the broom and brush clamp now in use.

Notice to Proprietors of British Patents.

We append a list of British patents, secured through the MINING AND SCIENTIFIC PRESS Patent Agency, upon which the British tax becomes due in the year 1876. Proprietors of these patents should see that their patents and the amount of money required to pay the tax and agency fees is deposited with us at least one month prior to the day upon which the tax is due:

No. 1,291 (1869), Hawkhurst & Pollock, preventing corrosion of steam boilers, £100, due April 25th; No. 1,568 (1869), Johnston, distilling apparatus, £100, due May 19th; No. 1,062 (1873), Van Laak & Gillespie, bungs and bung inserters, £50, due March 20th; No. 1,298 (1873), Shaw, printing type and tools, £50, due April 7th; No. 1,753 (1873), Huntington, steam boilers and furnaces, £50, due May 14th; No. 2,005 (1873), McWilliams, sheep shears, £50, due June 4th; No. 2,037 (1873), Stehns & Co., hoisting apparatus, £50, due June 9th; No. 2,067 (1873), Niel, reifier for distilling apparatus, £50, due June 10th; No. 2,435 (1873), Fisher, preventing oxidation of metals, £50, due July 14th; No. 3,613 (1873), Seward & Phillips, musical staff, £50, due Nov. 6th.

Inspecting Steam Boilers.

Pullen's bill for "The appointment of Inspector of Steam Boilers and Steam Tanks and for the better security of life and property in the city and county of San Francisco" reads as follows:

SECTION 1. There shall be appointed by the Board of Supervisors of the city and county of San Francisco, on the first Monday in May, or as soon thereafter as practicable, one Inspector of Steam Boilers and Steam Tanks, who shall hold office for the term of two years. The term Inspector hereafter in this act used shall mean Inspector of Steam Boilers and Tanks for the city and county of San Francisco.

Sec. 2. The Inspector shall have at the time of his appointment a chief engineer's certificate from United States Inspectors.

Sec. 3. The Inspector shall, upon application in writing of any owner or owners, inspect all stationary boilers and steam tanks used within the city and county of San Francisco for generating steam to drive or work machinery, and at least once in every year thereafter he shall subject all boilers to the hydrostatic pressure, and shall satisfy himself by thorough examination that such boilers or tanks are well made and of good and suitable material, that the arrangement for delivering the feed water is such that the boilers cannot be injured thereby, and that such boilers and machinery and the appurtenances may be safely employed in the service proposed in the written application, without peril to life or property. In subjecting to the hydrostatic tests boilers usually designated and known as high pressure boilers, the Inspector shall assume 120 pounds to the square inch as the maximum pressure allowable as the working power for a new boiler of 42 inches in diameter, made in the best manner, of inspected American iron plates, one-fourth of an inch thick, and of a quality required by the law governing United States Inspectors of Steam Boilers, and shall rate the working power of all high pressure boilers, whether old or new, according to their strength, compared with this standard, and in all cases the test applied shall not exceed the working power allowed in the ratio of 180 pounds test pressure, to 120 pounds to the square inch, working pressure. Should the Inspector be of the opinion that any boiler, by means of its material or construction, will not safely allow so high a working pressure as is above described, he may, for reasons to be stated specially in his certificate, fix the working pressure of such boiler as he in his discretion may deem proper, provided that the pressure so fixed shall not exceed two-thirds of the test pressure.

Sec. 4. Every boiler shall be provided with a good, well constructed safety valve, or valves, and shall be provided with a sufficient number of gauge cocks. The Inspector shall license and classify engineers of stationary engines. It shall be unlawful to employ any person, or for any person to serve as engineer of any stationary engine, who is not licensed by the Inspector, and any one who violates this section shall be guilty of a misdemeanor, and each day of such employment or service shall constitute a new offense.

Sec. 5. Every engineer who receives a license, shall, before entering upon his duties, make oath before the Inspector, to be recorded with his certificate, that he will faithfully and honestly, according to his best skill and ability, perform all the duties required of him by law.

Sec. 6. If any engineer shall refuse at any time to admit into his engine room any person whom the owner may desire to place there for the purpose of learning the profession of engineer, his license shall be revoked upon proof satisfactory to the Inspector of such refusal.

Sec. 7. The Inspector shall receive the sum of \$3 for every stationary boiler or tank so inspected by him, the same to be paid by the person or persons, firm or company, having the boiler in use, and for each engineer licensed the Inspector shall receive from the person so licensed the sum of \$2.

Sec. 8. Within fifteen days after his appointment and qualification, the first Inspector appointed under the provisions of this act shall publish or cause to be published once a week for at least four weeks, in at least three daily newspapers printed and published in the city and county of San Francisco, a notice of his appointment, and requiring all persons owning or using any stationary steam boiler or tank situate within said city and county, to report to him in writing the location of any and all such boilers or tanks owned or in use by him or them, and the business or purpose for which such boilers or tanks are used; and all such owners or users shall, within thirty days after the publication of said notice, make the report provided for in this section. And any person intending to erect or use any steam boiler or tank shall in like manner, and without notice, report to the Inspector the location and purpose of such steam boiler or tank, so that the same may be inspected before being used. Any person violating any of the provisions of this section shall be guilty of a misdemeanor.

Sec. 9. The Inspector shall give bonds in the sum of \$10,000, with security to be approved by the Judge of the County Court of the city and county of San Francisco, and the said Inspector shall by the judge of the said court be duly sworn or affirmed to perform the duties of his office, and that he will not accept any money, gift, gratuity or consideration whatever

from any person or persons whomsoever, during his term of office, except such as shall be prescribed in this act; and upon conviction of violation of such oath or affirmation before any court of competent jurisdiction he shall be subject to a fine not exceeding \$2,000, and to undergo an imprisonment in the county jail of the said city and county, not exceeding one year, both or either at the discretion of the court.

Sec. 10. The Inspector shall provide all requisite apparatus, machinery and stationery for carrying this act into effect, to be approved by the Board of Supervisors, and paid for by the Inspector out of the moneys received by him for inspection and licenses.

Sec. 11. The penalties and forfeitures which may be incurred for offenses against this act may be sued for, prosecuted and recovered by action to be brought in any court of competent jurisdiction by the Inspector in the name of the people of the State of California, and the moneys collected in such action, less the costs and expenses incurred in the prosecution of such action, shall be paid over to the Treasurer of the city and county of San Francisco.

Sec. 12. This act shall take effect on and after the first Monday in May, 1876.

General News Items.

CHICO had a \$20,000 fire on Sunday last.

THE Servians are determined to fight the Turks.

CONGRESS talks about investigating the whiskey business.

PENNSYLVANIA rivers are being stocked with California salmon.

ARCHER'S Fare and Freight bill has passed the Assembly.

THE San Francisco clearing house will be opened March 11th.

THE Japanese Centennial Commission arrived on the *Gaelic*.

EX-SENATOR WILLIAM WIAT PENDEGAST died at Santa Rosa on Wednesday last.

A STEAM railroad from Oakland to Berkeley is among the early probabilities.

DOM PENO, the emperor of Brazil, is coming to our Centennial exposition.

A STURGEON-SMOKING factory is to be established at Benicia by Eastern capitalists.

THE floods in Hungary have caused very great damage, rendering thousands houseless.

THE P. M. S. S. company's steamers have ceased to call at San Pedro and Santa Monica.

THE Street Department fund and School fund of San Francisco are both exhausted.

THE steamer *Mary Belle*, the largest boat on the Mississippi, was burned at Vicksburg on Sunday.

THE "Historical Elm," of Boston common, after an existence of 200 years was blown down by the gale of the 15th ult.

A HURRICANE in Missouri last week destroyed half a million dollars' worth of property in five minutes.

"LUCKY BALDWIN'S" new theatre on Market street will be opened for the first time next Monday.

THE Mexican Border Committee will report in favor of three regiments of cavalry being stationed on the border.

A BILL is before the Legislature to create the county of Santa Ana out of the southeast part of Los Angeles county.

A BILL has been reported favorably in the House from the Committee on Retrenchment, reducing the President's salary to \$25,000.

THE Senate has confirmed D. J. Barrow, of Nebraska, as United States Consul at Dublin, and John M. Wilson as Consul at Hamburg.

LOUIS J. JENNINGS, late editor of the N. Y. Times, has sold out his interest of nine shares for \$100,000, the purchaser being George Jones, publisher.

THE delinquent list for the second assessment of \$500,000 on the stock of the Bank of California shows only nine delinquents and a total of only \$26,000.

THE workshop buildings at the State prison at San Quentin were burned on Wednesday, causing heavy loss to the State and contractors. The prisoners behaved well and there were no escapes.

DON CARLOS, the pretender to the Spanish throne, entered France on Saturday. It is reported that he has issued a manifesto announcing that he relinquished the struggle in order to promote the welfare of Spain.

THE Legislative Committee on claims has reported adversely on the bills for the relief of General Sutter and J. W. Marshall, of gold discovery notoriety, and on the bill to pay the \$20,000 claim of Joseph Neumann, of San Francisco, for two silk flags.

THE marriage of Professor Tyndall to Miss Louisa Claude Hamilton took place on Tuesday at Westminster Abbey. The ceremony was performed by Dean Stanley. Thomas Carlyle, Professor Huxley, Dr. Hooker and Sir F. Pollock were present.

SENATOR JONES says that, without exception, all the newspaper articles purporting to describe what his hill or speech on the silver coinage question will contain are unauthorized, incorrect and imperfect. He withholds a description of the plan until an explanatory report is ready to accompany it.

New Books.

"SAFETY VALVES" is the title of No. 21 of Van Nostrand's Science Series, for sale in this city by Payot, Upham & Co. Richard H. Buel, C. E., the author, does not pretend to offer much that is original, but has strived to gather what is valuable from the great mass of material to be found in scientific periodicals and in publications that are not generally accessible. An endeavor has been made to systematize the treatment of the subject and to give such varied solutions of the problems that arise in proportioning the parts of safety valves as to render them plain to those who have only an elementary education. The importance of having the general principles of safety valves understood by those who are charged with the care of steam machinery cannot well be overestimated. With a safety valve that is in reality all which its name implies, a large proportion of the risks incident to the use of boilers will be avoided; while on the other hand, a safety valve that is only such in name, is one of the readiest assistants to a disastrous explosion. This quotation from the author's introductory shows what the work is. We opine that it will be instructive and useful to engineers and others having anything to do with steam boilers.

COLOMBIAN BUSINESS DIRECTORY AND ANNUAL REGISTER FOR 1876.—This work contains a classified list of all the business and professional men, officers, societies, schools, churches, etc., in all cities and towns of Colorado, together with postoffices, express and telegraph, railroad and stage offices. This is the second annual volume of the directory and it contains much useful information concerning the resources of the Territory, as well as the lists mentioned. We are indebted to J. Alden Smith, Territorial Geologist, for courtesy in sending this publication. We extract the following concerning the coal mines of the Territory: "The principal coal mines are in Boulder, Jefferson and Weld counties, north, and Fremont, Las Animas and Conejos, south of the divide; the most extensive measures are in Boulder county. The coal of Colorado can be divided into three classes: First class—anthracite of Gunnison river and branches, non-coking, contain 150 per cent. water, 91 per cent. carbon. Second class—coking coal, Trinidad, 8.84 per cent. water, 59 to 64 per cent. carbon. White river coal contains 85 per cent. carbon, 4 per cent. water. Third class—non-coking, Murphy, Marshall, Golden, and Baker coal contains on an average 13 per cent. water, 31 per cent. volatile matter and 52.20 per cent. carbon. Eighteen coal mines, extending from Canon City to the St. Vrain river, produced from January 1st, 1864, to October 1st, 1875, 511,154 tons, valued at \$2,044,610. The value of the entire product in 1870 was estimated at \$375,000; in 1873, according to the Governor's message, \$1,000,000. The yield for 1875 must have reached \$1,500,000."

UNITED STATES GEOLOGICAL SURVEY OF THE TERRITORIES.—We have received Bulletin No. 6 of the second series of these pamphlets, issued by the Government. This number contains: "An Account of the Various Publications Relating to the Travels of Lewis & Clarke with a Commentary on the Zoological Results of their Expedition," by Dr. Elliott Cress; "Notice of a Very Large Goniolite from Kansas," by F. B. Meek; "Fossil Orthoptera from the Rocky Mountain Tertiaries," by Samuel H. Scudder; "Studies of the American Falconidae," by Robert Ridgway.

New Incorporations.

The following companies have filed certificates of incorporation in the County Clerk's office at San Francisco:

EDGEWOOD G. & S. M. Co.—February 24th. Location, San Bernardino county, California. Directors—Joseph A. Wells, Joshua J. Ayres, J. M. Hackett, C. A. Burr and C. D. Morrison. Capital stock, \$5,000,000.

BELLEVILLE M. Co.—February 25th. Location, Columbus district, Esmeralda county, Nevada. Directors—E. M. Fay, Walter Turnbull, Geo. W. Fisher, Wm. H. Sears and A. W. Rose, Jr. Capital stock, \$5,000,000.

ROUCH & READY G. & S. M. Co.—February 25th. Location, Nevada county, Cal. Directors—L. L. Brown, T. D. Bradford, N. B. Childs, T. L. Bibbins and J. M. McCrory. Capital stock, \$5,000,000.

VERITAS CONSOLIDATED G. & S. M. Co.—February 25th. Location, Storey county, Nevada. Directors—E. J. Baldwin, Robert Sherwood, Samuel T. Curtis, James M. Galloway and J. P. Cavalier. Capital stock, \$11,500,000.

SOUTH END M. Co.—February 25th. Location, State of Nevada. Directors—Edward F. Stone, W. S. Lyle, John S. Rae, R. N. Graves and J. M. Walker. Capital stock, \$10,000,000.

CITY OF BOSTON M. Co.—February 24th. Location, Virginia mining district, Nevada. Directors—F. A. Morgan, Frank Otis, B. L. Brandt, A. G. Burnett and E. W. Smith. Capital stock, \$10,000,000, in 100,000 shares of \$100 each.

FONTANA M. Co.—February 25th. Location, Esmeralda county, Nevada. Directors—Harry W. Pummer, O. P. Ferry, Cornelius Platt, Giuseppe Fontana, Arazio Stiglieno, Charles E. DeLong, Braggio Guererro, William Mann R. Johnson and Thomas Pettinelli. Capital stock, \$10,000,000, in 100,000 shares of \$100 each.

CENTRAL M. Co.—February 20th. Location, State of Nevada. Directors—Philip Kitz, J. B. Harfield, J. Pershacker, John G. Kno, K. Louis Kaplan. Capital stock, \$10,000,000, in 100,000 shares of \$100 each.

JOSEPH ROSSI, an Italian miner, 34 years old, was buried by a cave near Volcano, Saturday, and instantly killed; three other men who were with him barely escaped.

METALS.

(WHOLESALE.)

WEDNESDAY M., March 1, 1876.

American Pig Iron, 10 ton	35 00	36 00
Scotch Pig Iron, 10 ton	35 00	37 00
White Pig, 10 ton	35 00	38 00
Oregon Pig, 10 ton	35 00	40 00
Refined Bar, good assortment, 10 lb.	—	—
Boiler, No. 1 to 4	—	—
Plate, No. 10 to 14	—	—
Sheet, No. 16 to 20	—	—
Sheet, No. 22 to 24	—	—
Sheet, No. 26 to 28	—	—
Horse Shoes, per doz.	5 50	8 00
Nail Rod	10 00	—
Norway Iron	—	—
Roller Iron	—	—
Other Irons for Blacksmiths, Miners, etc.	—	—
COPPER.		
Strainers	35 00	—
O'Neil's Pat.	37 00	—
Sheathing, 10 lb.	24 00	—
Sheathing, Yellow	24 00	—
Sheathing, Old Yellow	24 00	—
Composition Nails	24 00	—
Composition Bolts	24 00	—
STEEL—English, 10 lb.	20 00	—
Anderson & Woods' American Cast.	—	—
Drill	15 00	—
Flat Bar	18 00	—
Flat Steel	9 00	—
TIN PLATES.		
10x14 10 Charcoal	10 50	11 00
10x14 10 X Charcoal	12 50	13 00
Roofing Plate 10 Charcoal	10 00	10 50
Rancho Rio	26 00	—
Australian	18 00	—
ZINC.		
By the Case	—	—
Sheet 10 lb. No. 1 to 10	—	—
do do 10 lb. No. 11 to 14	—	—
do do 10 lb. No. 15 to 18	—	—
do do 10 lb. No. 19 to 22	—	—
do do 10 lb. No. 23 to 26	—	—
NAILS Assorted sizes	3 60	3 75
GIROKILVER, 100 lb.	72 00	75 00

LEATHER.

(WHOLESALE.)

WEDNESDAY M., March 1, 1876.

City Tanned Leather, 10 lb.	22 00	22 25
Santa Cruz Leather, 10 lb.	22 00	22 25
Country Leather, 10 lb.	22 00	22 25
Stockton Leather, 10 lb.	22 00	22 25
Jodot, 8 Kil., per doz.	50 00	—
Jodot, 11 to 15 Kil., per doz.	50 00	—
Jodot, 14 to 19 Kil., per doz.	52 00	—
Jodot, second choice, 11 to 15 Kil., per doz.	57 00	—
Cornellian, 12 to 15 Kil.	57 00	—
Cornellian Females, 12 to 15 Kil.	57 00	—
Cornellian Males, 14 to 16 Kil.	71 00	—
Simon Ulmo Females, 12 to 15 Kil.	58 00	—
Simon Ulmo Females, 15 to 18 Kil.	58 00	—
Simon Ulmo Females, 18 to 20 Kil.	61 00	—
Simon, 20 Kil., per doz.	65 00	—
Simon, 22 Kil., per doz.	72 00	—
Robert Calif, 7 and 9 Kil.	55 00	—
French Kips, 10 lb.	1 00	1 15
California Kip, 10 lb.	40 00	—
French Sheep, all colors, 10 lb.	5 00	15 00
Eastern Calif for Barks, 10 lb.	1 00	1 25
Sheep Roans for Topping, all colors, 10 lb.	9 00	13 00
Sheep Roans for Lining, 10 lb.	5 50	10 00
California Finest Sheep Lining	1 50	4 50
Best Jodot Calf Boot Legs, 10 lb.	5 00	5 25
Good French Calf Boot Legs, 10 lb.	4 00	4 75
French Calf Boot Legs, 10 lb.	4 00	—
Harness Leather, 10 lb.	24 00	25 00
Fair Bridle Leather, 10 lb.	45 00	47 00
Skirting Leather, 10 lb.	35 00	37 00
Light Leather, 10 lb.	30 00	32 00
Buff Leather, 10 lb.	17 00	—
Wax Side Leather, 10 lb.	17 00	—

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by CHARLES SUTRO & Co.]
SAN FRANCISCO, March 1, 3 P. M.

LEGAL TENDERS in S. F., 11 A. M., 88 1/2 to 89.
GOLD in N. Y. 114 1/4.
GOLD BARS, 900. SILVER BARS, 11 and 15 per cent. discount.

EXCHANGE on N. Y., 60-90 per cent. premium for gold; on London bankers, 48; Commercial, 44 1/2; Paris, five francs per dollar; Mexican dollars, eight to ten per cent. discount.

LONDON—Consols, 93 to 93 1/2; Bonds, 102 1/2.
QUOTATIONS in N. F. by the Bank, per lb. 72 1/2 to 75.

Too YOUNG TO DIE.—Thousands of young persons between the ages of 16 and 25 die of consumption, every one of whom might have been saved by using HALE'S HONEY OF HOREHOUND and Taro when the cough first sets in.
Pike's Toothache Drops cure in one minute.

WOODWARD'S OARBENS embraces an Aquarium, Museum, Art Gallery, Conservatories, Tropical Houses, Menagerie, Seal Ponds and Statuary Rink.

9 ALL SIZES
12 HORSE POWER
15 Hoadley's
18 PORTABLE Engines
20 TREADWELL & Co

From year to year they have been improved under the personal supervision of Mr. Hoadley. The last great improvement is the REGULATING OUT-OFF, with balanced valve, thus giving it all the economy and increased power of the most thorough-built Corliss Stationary Engine. By this addition, a 15-horse power Hoadley Portable can be run at over 40-horse power, if required. As a Thrashing Engine, the Hoadley is the leading engine of the country. It has no equal. For prices, etc., send to
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Mission Street, near Third.

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With first-class Dramatic Company. Box Office open from 9 A. M. to 10 P. M.

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Doors open at half past seven. Commence at eight o'clock.

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BUSH STREET, ABOVE KEARNY.

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For Mining, Shipping, and General Purposes.

All kinds and sizes on hand, or made to order; guaranteed of unsurpassed quality, and manufactured of my length. FLAT ROPES, ROUND ROPES and CAPEL ROPES, OF IRON OR STEEL.

Patent Endless Wire Ropeway

(WIRE TRAMWAY.)

FOR THE RAPID AND ECONOMICAL TRANSPORTATION OF ORES AND OTHER MATERIAL OVER MOUNTAINOUS AND DIFFICULT ROADS.

This system has been in use for over three years, and given thorough satisfaction.

PATENT GRIP PULLEY,

or transmission of power by means of wire ropes

WIRE.

Fencing Wire and Staples,

ALING WIRE.

SPRING WIRE,

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BROOM WIRE,

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COPPER WIRE,

BRASS WIRE,

And Wire of all kinds, on hand or made to order.

SOLE AGENT FOR

Richard Johnson and Nephews' Celebrated Telegraph Wire.

Full stock on hand in bond, or duty paid.

Wire Cloth and Wire Netting.

FULL ASSORTMENT ON HAND FOR ALL PURPOSES, AND

All Kinds of Goods in the Wire Line.

Send for Circulars, Etc., to

A. S. HALLIDIE,

113 and 115 Pine Street, S. F.

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

California Acclimatizing Society—Location of principal place of business, San Francisco, Cal. Notice is hereby given, that at a meeting of the Board of Directors, held on the ninth day of February, 1876, an assessment of fifty cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold and silver coin to the Secretary, at the office of the company, room No. 37, Nevada block, northwest corner of Pine and Montgomery streets, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the fourth day of March, 1876, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the third day of April, 1876, to pay the delinquent assessment, together with costs of advertising and expense of sale. W. W. FAY, Secretary, pro tem. Office, room 37, Nevada block, San Francisco, Cal.

Josephine Gravel Mining Company—Principal place of business, San Francisco, Cal. Location of works, Brushy Canon, Placer county, Cal. Notice is hereby given, that at a meeting of the Board of Directors, held on the twenty-third day of February, 1876, an assessment of ten cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold and silver coin, to the Secretary, at the office of the company, 531 California street, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the twenty-fifth day of March, 1876, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the tenth day of April, 1876, to pay the delinquent assessment, together with costs of advertising and expense of sale. W. M. SMALL, Secretary. Office, No. 531 California street, San Francisco, Cal.

Mariposa Land and Mining Company of California. Location of principal place of business, San Francisco, Cal. Location of works, Mariposa county, Cal. Notice is hereby given that at a meeting of the Board of Directors held on the twenty-third day of February, 1876, an assessment of one dollar per share was levied upon the capital stock of the corporation, payable immediately in United States currency to the Secretary, at the office of the company, room 33, Nevada block, No. 309 Montgomery street, San Francisco, Cal. or to the Agent-Secretary, at the office, No. 9 Nassau street, New York, N. Y. Any stock upon which this assessment shall remain unpaid on the twenty-fourth day of March, 1876, will be delinquent, and advertised for sale at public auction, and unless payment is made before will be sold on Monday, the tenth day of April, 1876, to pay the delinquent assessment, together with costs of advertising and expense of sale. By order of the Board of Directors.
LEANDER LEAVITT, Secretary.
Office, room 33, Nevada block, No. 309 Montgomery street, San Francisco, Cal.

New England Tunnel and Smelting Company—Location of principal place of business, San Francisco, Cal. Location of works, Tulare county, Cal. Notice is hereby given, that at a meeting of the Board of Directors, held on the fifteenth day of February, 1876, an assessment of ten cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold and silver coin to the Secretary, at the office of the company. Any stock upon which this assessment shall remain unpaid on Saturday, the twenty-fifth day of March, 1876, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Tuesday, the fourth day of April, 1876, to pay the delinquent assessment, together with costs of advertising and expense of sale. CLINTON C. TRIPP, Secretary. Office, room 10, No. 401 California street, San Francisco, Cal.

The Northwest Silver Mill.

The following interesting description of the new silver mill of the Northwest company, at Philipsburg, Montana, which has recently made so promising a start, is furnished to the *New Northwest* by a special correspondent at Philipsburg:

The Building.

131 feet long, is upon a side hill, and is on the terrace plan, containing four steps or stories. The ore road along the hill side, 12 feet above the upper story, makes a fifth step or terrace.

The fourth or upper story, 22x40, is the ore room, containing a Blake rock breaker, through which the ore is fed and falls upon the drying floor in the story below.

The next (third) story, 36x40, contains first the drying floor, which is simply a horizontal floor, 4x4, from the furnaces, built across the mill and back to the stack, covered with iron plates, thus giving a drying surface, 8x40 for ore, and 4x30 for salt. When dry, the ore is shoveled into a car, and, after weighing, dumped before the batteries. Of these there are two or five 700 pound stamps each. The stamps each drop seven and a half inches one hundred times per minute. The ore dusts through brass wire screens of 3,600 meshes per square inch, whence it is automatically conveyed into sheet iron hoppers, three in number, one above each furnace.

The next story, 40x65, contains two rooms—the roasting room, 38x40, and the cooling room, 38x25. In the roasting room are three Bruckner furnaces, the first ever used in Montana. These are cylinders of boiler iron, five and a half feet in diameter, 12 feet long, set horizontally, lined with ordinary brick and having inside a screw shaped partition or diaphragm, which at each turn shifts and mixes the ore. Each end of the cylinder has a neck in front connecting with a fire box, and in the rear with a condensing flue. The cylinder rests upon friction rollers, and is revolved by means of cog gearing about 25 times per hour. The ore is let fall from the hoppers above into the cylinders through doors, and is discharged when roasted, by the same doors into a car. The car is drawn into the cooling room, which is paved with brick, and there dumped.

The lower story, 35x77, has three rooms. First the hoiler and engine room, 25x35; next the amalgamating room, 38x35, and then the retort and smelting room, 18x35. The amalgamating room is in three floors. The upper floor, on the same level as the cooling room, has a car in which the roasted ore is taken to the pans. There are three pans now running, and two more will soon be put in. A fall of about four feet from the pans brings ore to the level of the settlers, of which there are now two, and a third to be added. Then a descent of about seven feet to the lower story, on which level are the engine and smelting rooms. The engine is twelve inch bore and 20 inch stroke, and does its work easily and well.

The Method.

After drying and crushing, the ore in charges of 3,000 pounds is let into a cylinder with five per cent. of salt. A quick beat is applied until the ore is thoroughly warmed, when the cylinder is put in motion and kept revolving at a varying heat, according to the condition of the ore, until the charge is done. That point is known by the smell of the roasting ore, and also by chemical tests. The roasting of this ore takes from five to seven hours per charge of 3,000 pounds. It is then dumped and cooled, either with time or water. It is then taken, in charges of 1,000 pounds to the small pans, and 2,000 pounds to the large pan, mixed with water to a very thick paste and steam applied. In from two to two and a half hours from 20 to 25 per cent. of quicksilver is put in the pans, which then are let run four to six hours longer. Then water is added until the pulp is thin, when the pan is discharged, the pulp and part of the quick flowing into the settler. The rest of the mercury is caught in vessels and strained through canvas socks. The residue is an amalgam of about one part of silver to five parts of quick. This is retorted and smelted into bars. The pulp from the settlers, now reduced to refuse "tailings," is gradually drawn off in time to leave the settler free for the next charge.

The Results

Thus far are very satisfactory. But one charge has been roasted to less than 90 per cent., the average reaching nearly 92 per cent. of the assay transformed into chloride of silver, fit for amalgamation, and samples of the "tailings" taken every hour in the 24, show that less than 10 per cent. of the assay is running off. In 24 hours the engine burns five, the cylinders four, and the dry-kiln one and a half cords of wood. The men employed for 24 hours are: Blake crusher, one; dry-kiln, three; stamps, three; cylinders, two; cooling floor, two; pans, two; one amalgam drawer and retorter; two engineers and one woodman; in all 17 men, besides assayer and foreman. The engine and boiler, the stamps in part, the shafting, flanging and dry-kiln plates were furnished by Davis & Tatem, of Helena; the sheet iron work and hardware by Kinna & Jack; the pans and settlers from San Francisco and from Chalmers & Co.; the cylinders by Lane & Bodley, Cincinnati, Ohio. The mill was built from plans furnished by Charles E. Sherman, agent for the Bruckner cylinders.

Two men were drowned in the Rock Island mine on the Comstock this week, while tapping a winze filled with water.

The Simplest, Cheapest, Most Effective and Durable

Power Drill is the New

"CALIFORNIA" ROCK DRILL,

MANUFACTURED BY

HAWKINS & CANTRELL, San Francisco, Cal.,

AND SPECIALLY DESIGNED TO MEET THE REQUIREMENTS OF MINERS ON THE PACIFIC COAST

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AIR COMPRESSORS,

And Complete Mining Outfits for Power Drills.

Address,

L. W. COE,

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GIANT POWDER.

Patented May 26, 1868.

THE ONLY SAFE BLASTING POWDER IN USE.

GIANT POWDER, NO. 1,

For hard and wet Rock, Iron, Copper, etc., and Submarine Blasting.

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For medium and seamy Rock, Lime, Marble, Sulphur, Coal, Pipe Clay and Gravel Bank Blasting, Wood, etc.

Its EXCLUSIVE use saves from 30 to 60 per cent. in expenses, besides doing the work in half the time required for black powder.

The only Blasting Powder used in Europe and the Eastern States.

BANDMANN, NIELSEN & CO.,

General Agents, No. 210 Front Street.

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Iron and Machine Works.

THE RISDON

Iron and Locomotive Works,

INCORPORATED.....APRIL 30, 1874.
CAPITAL.....\$1,000,000.

LOCATION OF WORKS:

Corner of Beale and Howard Streets,
SAN FRANCISCO.

Manufacturers of Steam Engines, Quartz and Flour Mill Machinery, Steam Boilers (Marine, Locomotive and Stationary), Marine Engines (High and Low Pressure). All kinds of light and heavy Castings at lowest prices. Cams and Tappets, with chilled faces, guaranteed 40 per cent. more durable than ordinary iron.

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HAWKINS & CANTRELL,

MACHINE WORKS,

210 & 212 Beale St.,

Near Howard, - - - SAN FRANCISCO.

MANUFACTURERS OF

Steam Engines and all kinds of Mill
and Mining Machinery.

Also manufacture and keep constantly on hand a supply of our

Improved Portable Hoisting Engines,

From Ten (10) to Forty (40) Horse Power.

N. B.—Jobbing and Repairing done with Dispatch.

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MANUFACTURERS OF

STEAM ENGINES.

Quartz, Flour and Saw Mills.

Hayes' Improved Steam Pump, Brodie's Improved Crusher, Mining Pumps, Amalgamators, and all kinds of Machinery.

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STEAM ENGINES AND BOILERS

Of all sizes—from 2 to 60-Horse power. Also, Quartz Mills, Mining Pumps, Hoisting Machinery, Shunting, Iron Tanks, etc. For sale at the lowest prices by

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OF ALL KINDS.

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Established for the Manufacture of

RAILROAD AND OTHER IRON

Every Variety of Shafting.

Embracing ALL SIZES of

Steamboat Shafts, Cranks, Piston and Connecting Rods, Car and Locomotive Axles and Frames.

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Of every description and size.

Orders addressed to PACIFIC ROLLING MILL COMPANY, P. O. box 2032, San Francisco, Cal., will receive prompt attention

The highest price paid for Scrap Iron.

SHEET IRON PIPE.

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Risdon Iron and Locomotive Works

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Are prepared to make SHEET IRON AND ASPHALTUM PIPE, of any size and for any pressure, and contract to lay the same where wanted, guaranteeing a perfect working pipe with the least amount of material.

Standard sizes of railroad Car Wheels, with special patterns for Mining Cars. These small wheels are made of the best Car Wheel Iron, properly chilled, and can be fitted up with the improved axle and box—introduced by this company, and guaranteed to outlast any other wheels made in this State.

All kinds of Machinery made and repaired.

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Builders of QUARTZ, SAW AND FLOUR MILLS

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MACHINERY AND CASTINGS

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Heavy Forging Boilers, Stationary
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JOBBER AND REPAIRING WORK OF EVERY
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NOTICE.—Particular attention paid to making Superior Shoes and Dies.

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CROSS' PATENT ROILER FEEDER AND SEDIMENT
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Dunbar's Patent Self-Adjusting Steam Piston

PACKING, for new and old Cylinders.

And all kinds of Mining Machinery.

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Heavy and light Castings of every description. House Fronts, Mining and General Machinery estimated and constructed at shortest notice. On hand the celebrated Occident and French Ranges, Burlal Caskets, Grates and Fenders, Road-Scrapers, Hydrants, Tugue Irons, Ploughwork, Sash Weights, Ventilators, Dumb Bells, Gipsies, Ship Castings, SOIL PIPE of all sizes, Fittings and Cauldron Kettles in stock at Eastern rates. SHOES and DIES a specialty. Ornamental Fences in large variety. 4v30-1yr.

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OF ALL KINDS OF CAR WORK,

Machine Bolts, Bridge Bolts and Ship or
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CALIFORNIA BRASS FOUNDRY,

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ALL KINDS OF Brass, Composition, Zinc, and Babbitt Metal Castings, Brass Ship Work of all kinds, Spikes, Sheathin Nails, Badder Braces, Hinges, Ship and Steamboat Belts and Gongs of superior tone. All kinds of Cocks and Valves, Hydraulic Pipes and Nozzles, and Hose Couplings and Connections of all sizes and patterns, furnished with dispatch.

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Machinery and Castings of all kinds.

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Manufacturers of Files of every Description

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Sold by all the principal hardware stores on the Pacific Coast. 18v25-1y

San Francisco Cordage Company.

Established 1856.

We have just added a large amount of new machinery of the latest and most improved kind, and are again prepared to fill orders for Rope of any special lengths and sizes. Constantly on hand a large stock of Manila Rope, all sizes; Tarrad Manila Rope; Hay Rope; White Line, etc., etc.

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GOLD MEDAL

AWARDED TO

San Francisco Steam Pumps.



AFTER ONE OF THE

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Ever Had in the United States,

BETWEEN COMPETITORS

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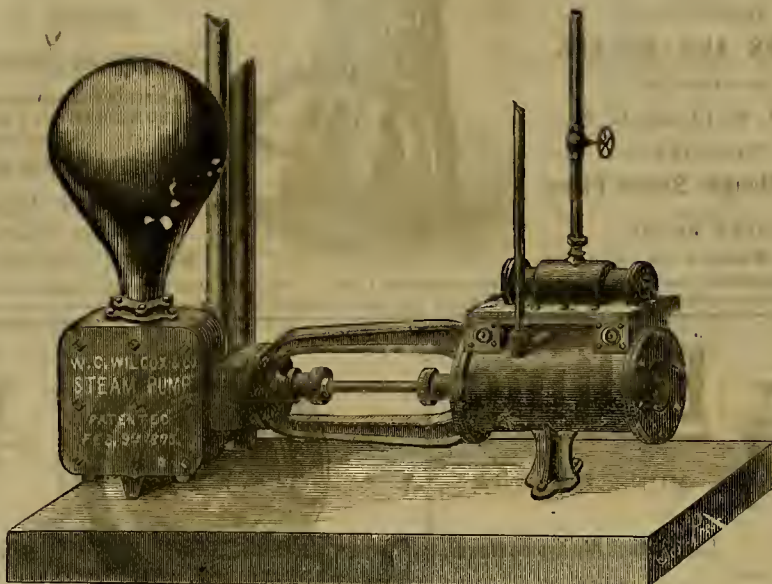
Best Established Reputation,

In which, at great expense, the different Steam Pumps were tried under every test known to experts, the Examining Committee of the Tenth Industrial Fair of the Mechanics' Institute have awarded to us their

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Best Steam Pumps on Exhibition.



We are prepared to furnish PUMPS UNDER CONTRACT, guaranteeing their ability to perform any specific work for which steam pumps are adaptable, such as

RAISING WATER FROM MINES,

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FEEDING BOILERS, RAISING WATER FROM WELLS, STEAMER AND SHIP PUMPS, ETC.

We would also call the attention of those interested, to our Direct Acting Deep-Well Pumps for raising water from

Any Desired Depth.

Also to our Especial Construction of Pumps FOR HANDLING QUICKSILVER or heavy liquids.

We claim that our Pumps are the **best** ever made in **simplicity** of construction, economical use of power, **durability** and perfect adaptability for general uses, and we ask all persons interested to investigate **our title to this claim.** Salesrooms at our Machine Shop, 114 and 116 BEALE STREET, SAN FRANCISCO.

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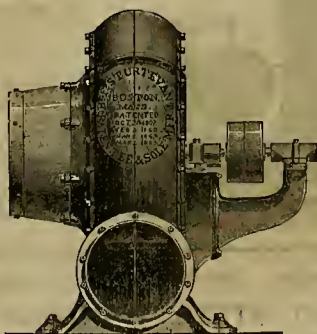
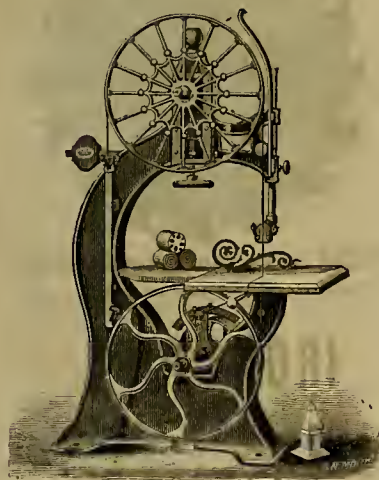
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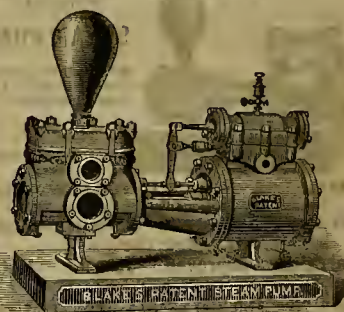
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BLAKE'S PATENT STEAM PUMP



Over 8,500 in Successful Use in the United States.

TULLOCH'S AUTOMATIC ORE FEEDERS

Increase the Capacity of each Battery Two to Three Tons per day.

SAVE LABOR! SAVE MORE GOLD!
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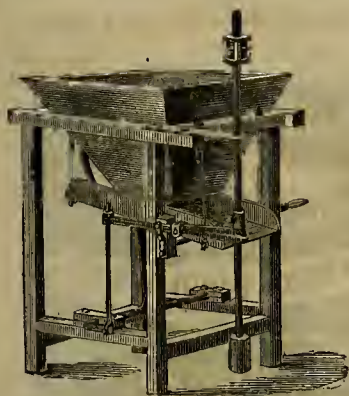
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WILL FEED ANY KIND OF ORE,
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ARE DIRECT ACTING. EACH MOTION SCRAPES A PORTION OF THE ORE INTO THE BATTERY. CAN REGULATE THE FEED. ARE SIMPLE AND DURABLE. ARE IN USE IN CALIFORNIA, NEVADA, IDAHO AND MEXICO. WARRANTED TO WORK.

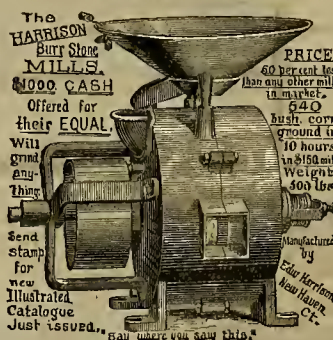
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"We started the heavy 20-inch Corn Mill last Friday you sent to Baldwin & Tabor, Manchester, N. H. We ran it most all day, and ground 60 bushels corn per hour. The mill you sent us at Haverhill, Mass., for A. S. Hook, is doing wonder fully. It is grinding on an average 2,500 lbs. good meal per hour, and has ground 2,800 lbs. in an hour. It is driven by an engine with a 9-in. cylinder, and takes the place of a 30-in. mill of another kind that, when doing its best and loading the engine with all it could carry, only ground 1,500 lbs. per hour. If there is a mill built that can beat that we would be pleased to see it brought out."

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Manufacturer of perforated sheet metals of every description, at reduced rates. Mill owners using Battery Screens extensively, can contract for large supplies at favorable rates. This is the only establishment on the Coast devoted exclusively to the manufacture of Screens

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E. B. Smith, for nearly twenty years engaged in the direction of mines and mining enterprises, can be engaged to take charge of any legitimate mining enterprise. Mr. Smith thoroughly understands the "Sonora" process of chlorination and lixiviation, being the originator of the same, and the erection of all machinery and furnaces for the treatment of rebellious ores. Office—439 Bush street, S. F.

MINERS write for your paper.

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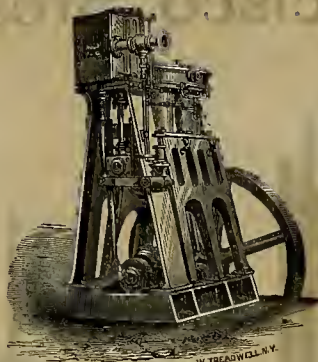
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For Mines.

Large Assortment of

MORSE TWIST DRILLS.



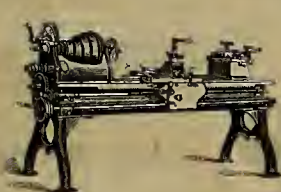
HASKINS' PORTABLE HOISTING ENGINES, constructed especially for economical use in mining districts, with Compressed Air or Steam, adapted to all classes of underground work and made throughout on the interchangeable plan, so that all parts can be duplicated when desired. Catalogues and Estimates given on application.



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Steam Gauges.

The very best in the country. A large stock at reduced prices.



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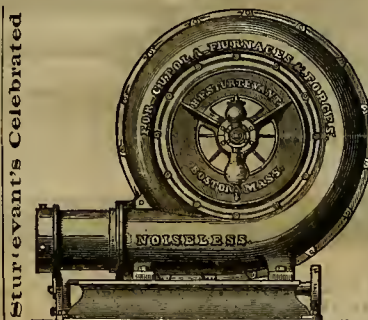
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Large Stock Always on Hand.

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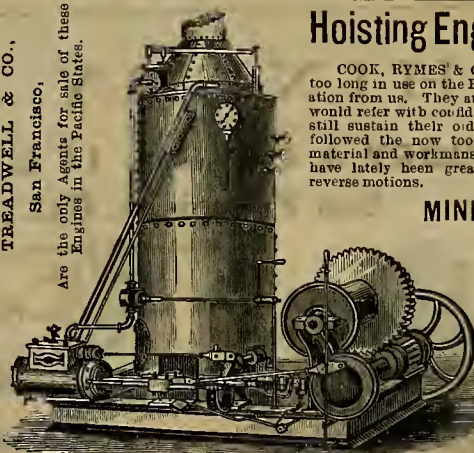
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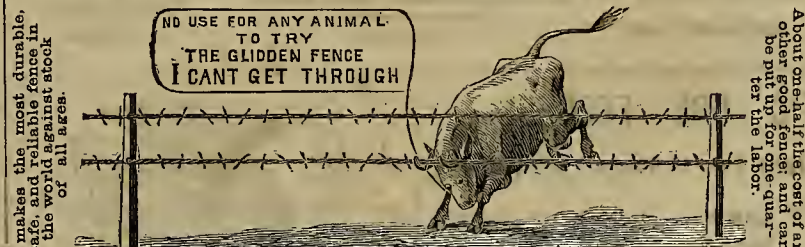
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SAN FRANCISCO, SATURDAY, MARCH 11, 1876.

VOLUME XXXII
Number 11.

The Abbott Concrete Pavement.

EDITORS PRESS.—An examination of the streets of San Francisco has satisfied me that they can be paved more economically and satisfactorily, with a bituminous concrete than with any other material. Having been engaged for many years in street paving of various kinds, but making a specialty of concrete in Eastern cities, some of my observations of the facilities for making such pavement in your city, may be of interest to your readers. My object in investigating the subject here has been to obtain information for a Massachusetts company, which has secured of me the rights for this State, and is now making arrangements to locate here permanently, with the capital and machinery necessary to do a street paving business.

There are several varieties of bituminous concrete used for pavements, all of which have been patented, and many have been successfully used. I shall write particularly of the kind known through the East as the "Abbott concrete," which I have been engaged in developing and perfecting for the last six years. The materials for such pavements as I shall describe are here in abundance; the climate is peculiarly favorable, the slight variation in temperature making it possible to overcome the difficulties experienced where changes of 100 deg. are constantly taking place. The sand foundation prevailing is favorable, making a good bed for the concrete, which, being absolutely waterproof, keeps the foundation dry, and no throwing of the pavement will occur, as in those varieties of pavements that are full of joints, which constantly allow the water free access to the foundation. These favorable conditions existing here, by which economy of construction and a reasonable durability are secured, the introduction of a pavement of this character becomes of great interest to all who desire clean, quiet roadways. The public is likely to think unfavorably of concrete from the fact that so much unevenness appears in the asphalt sidewalks, so common in this city, and yet the fact that so large a proportion of these walks are perfect, shows that good work can be done, if the proper conditions are secured.

The success of any concrete mixture depends very much on the uniformity of materials used, the exactness with which the proper proportions are arranged and the thoroughness of the workmanship. Unless strict attention is given to these points, the best material will be spoiled. This accounts for much of the failure so commonly experienced by novices in the business, and the realization of this fact has led me to personally supervise the introduction of my pavement into any new field. In

The Abbott Process, refined asphalt, either natural or artificial, is tempered to the proper consistency with creosote, which is the heavy oil extracted from coal tar by distillation. This composition is used at a heat of 400 degrees, to secure which a very strong, air-tight tank is used. A pyrometer indicates the temperature, and a fire box and flues are so arranged as to regulate the heat. These tanks can be made stationary or movable, according to the use required of them.

The system was invented by T. New of New York, and by it the possibility of manufacturing a uniform quality of material has been demonstrated. Before this invention, open kettles were used to melt the asphalt, the material was imperfectly melted, 250 degrees being about the highest heat obtained, and very unevenly distributed, while contact with the air caused evaporation largely to take place. By the tank system, large quantities of material can be held at the proper heat for any length of time without loss by evaporation. The gravel used in this process is also heated to 300 degrees by means of revolving heaters, constructed especially for the purpose. These heaters are worked by horse or steam power, and constant motion of the gravel is kept up, by which a circulation of hot air is provided, and an even heating of the gravel secured. This gravel heater is shown in Fig. 2. The hot gravel and composition are then rapidly mixed in definite proportions, by horse or steam power, and the mixed material carted to

the street, where it is spread and rolled with heavy rollers, setting firmly as it cools. To properly carry on street paving, machinery enough must be employed to turn out material with such rapidity that the joining of one load with another on the street shall be made while the material is hot. For the

Heavy Traveled Streets

of this city, I should recommend the following treatment:

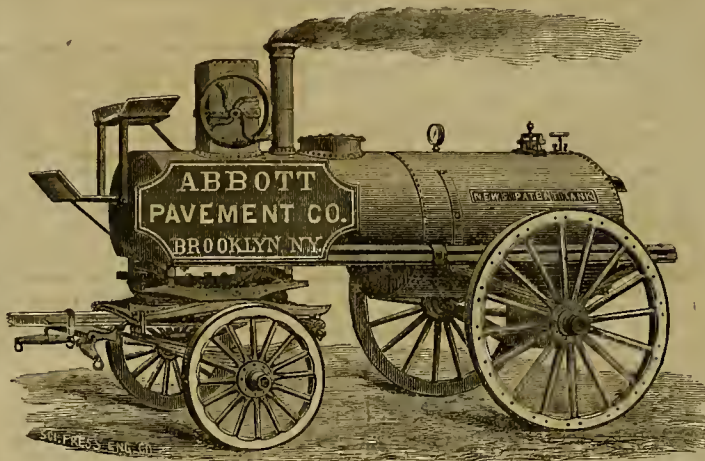
Prepare the road bed so as to require a pave-

ment and thoroughly paved in the method described, will present the following

Advantages Over Other Kinds of Pavement.

Its cost in this city will not exceed that of the best stone pavement. It will not be thrown out of place by the swelling up of water underneath, as the solid crust of seven inches thickness is entirely waterproof, and will actually resist water from the upper or under side. It will be a quiet street, because wheels move noiselessly over its surface, and no sound will

Fig. I.

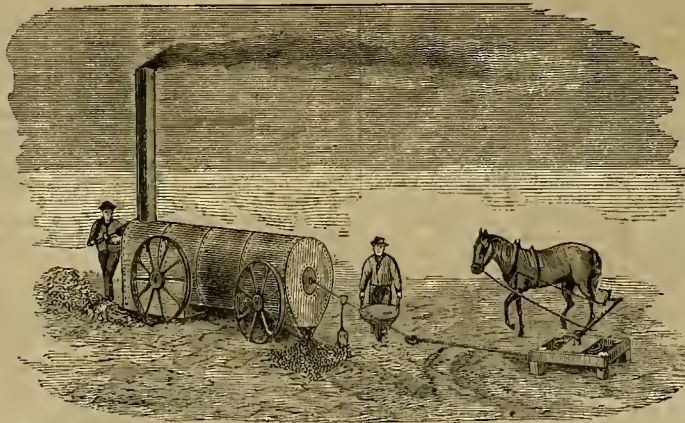


MOVABLE AIR-TIGHT TANK FOR MELTING REFINED ASPHALT.

ment seven inches thick. Roll the sand foundation well with a steam roller weighing not less than five tons. Lay a foundation of solid concrete four inches thick, composed of coarse gravel or broken stone, and the asphaltic composition described. Roll it with the steam roller while hot, and when it has cooled a firm,

be heard, except from the horses' hoofs. It will save much wear and tear on horses, vehicles and horse shoes, besides affording much comfort and pleasure to the riding public. It will be healthy, because its smooth surface is easily kept clean, and no crevices are found for the lodgement of filth. Heavier loads can

Fig. II.



REVOLVING GRAVEL HEATER FOR ABBOTT PAVEMENT.

herd foundation is secured. Surface this foundation with a three-inch layer of finer concrete made in a similar manner, grading and rolling with great care. Over this surface spread a hot

be hauled on it then on stone pavements, for there is no rough, uneven resistance to wheels. The Materials Are Imperishable, And, under the right system, such pavements

Fig. III.



SECTION OF ABBOTT PAVEMENT.

liquid asphaltic composition prepared for the purpose, and finish with clean, fine, hot gravel, rolling it in while hot. This done, the pavement is finished and ready for use. It will then have the appearance of the section of pavement shown in Fig. 3. A street, honestly

can be kept in repair at very light expense. The foundation need never be disturbed, while I estimate that the surface can be kept perfect for 10 years at an expense of not more than 50 cents per square yard, and left at the end of the ten years as good as when new.

But it will be asked, where has this pavement been tested, and how long. In Brooklyn, N. Y., it has been in use six years, and is now laid on over 12 miles of streets. In Cleveland, Ohio, it has been used five years, and is laid on over six miles of streets, including the beautiful Euclid avenue. In Washington, D. C., it was laid, three and four years ago, on about eight miles of streets, and the same character of pavement is laid on about 30 miles of streets in that city. In these three cities it has received the only practical test, constant public use for a series of years, and it has been found to answer all the requirements in economy and durability, while at the same time affording the most luxurious roadway for driving purposes that can be made. During the last year I have introduced it into the cities of Boston, Philadelphia, Providence, Chicago, St. Louis and Columbus, Ohio. It will be introduced here during this year, and this city, which, in many respects, is the most attractive in the country, though sadly deficient in good street pavements, will have the opportunity to beautifully and permanently improve its highways by this method. If any of your citizens, who visit the Centennial, would like to see for themselves how this pavement appears in practical use, let them give me a call at No. 16 Court street, Brooklyn, N. Y., and they shall take a ride over 12 miles of it behind a good team. N. B. ABBOTT.

S. F., Feb. 25th, 1876.

[We are pleased to meet Mr. Abbott here on such a mission. He comes personally well recommended, and at our special request has written the above communication, which to all interested in the important subject of good pavements, will repay perusal and consideration. We hope no time will be lost in giving us the first test of the work in this city, where at present we are sadly afflicted with very bad pavements.—Eds. Press.]

THE GEOLOGICAL SURVEY.—Although the bill for the continuance of the State Geological Survey was introduced in the Legislature some weeks since, nothing definite has yet been done with it. We hope the Legislature will make the necessary appropriation for carrying on the necessary work, as the amount asked is small and will do great good. Mr. W. A. Goodyear, who is mentioned favorably for State Geologist, is perfectly familiar with the wants of the miners, and would do what he could to please them. He is familiar with all the details of the former survey, and is better calculated than any one else to finish the work already commenced. Mr. Goodyear is a mining engineer, and would no doubt bestir himself to give us a volume in economic geology, and hunt up facts of interest and importance to the mining community. There is no good reason for stopping any longer a work which cost so much, when so little is left unfinished.

MINING MACHINERY.—Messrs. Parke & Lacy, agents for the Burleigh drilling machinery, Putnam Machine Co.'s machinists' tools, Haskins' engines and boilers, Farmer's electric machine for blasting, Hill's exploders, etc., have recently removed to a fine new building at No. 417 Market street. In these new quarters they have a fine commodious salesroom, where they are able to display samples of the various articles for which they are agents. They keep a very full line of mining machinery, which these interested in mining machinery will do well to examine. Their card will be found in our advertising columns.

It will take five cars to transport the Central Pacific railroad company's collection for the Centennial exhibition to Philadelphia. A recent addition to the display consists of a jar of earth from each agricultural district of the State, with accompanying specimens of grain raised from the soil. A number of ethnological specimens, belonging to the Academy of Sciences, is to go with the railroad company's collection.

A WORKMAN in the San Fernando tunnel, named Sullivan, was killed by a giant powder blast on Wednesday afternoon of last week, the charge hanging fire, and, when he went to examine it, going off and blowing a pickaxe entirely through his body.

CORRESPONDENCE.

Botanical Excursions.

[Written for this Press by J. G. LEMMON.]

No. 1.—Pyramid Lake and Humboldt Desert.

"Mr. Gray advises me to solicit you to collect specimens of the trees and shrubs of your region of country for exhibition at the Centennial. Can you undertake the work and do it well, according to specifications following. Also, will you make a collection of the general flora for me?" writes Dr. Geo. Vasey, botanist of the Agricultural Department at Washington.

This request was received in my snow-covered retreat at Webber lake, April 8th, 1875. I replied at once, accepting the task, and the evening of the second day after found me 40 miles on the great basin, gathering the early evanescent flora of that strange region.

But one can do little collecting alone, so I led my curly pony, packed to his ears with plants, back to Sierra valley, and beset in his school-room my companion on so many excursions, Prof. E. L. Cese, to accompany me on in the great basin to Pyramid lake—one of the reservoirs or residual seas of this once vast ocean. Thinking of the heavy labor and fierce exposure it involved, the Professor at first hesitated, but by dint of glowing descriptions and strong promises, he kindly consented.

Stowing our little wagon with bedding, food, and great beles of botanical paper, we scrambled down the long east side of Sierra valley, 35 miles to Beckworth pass, through which we emerged into the great Fremont basin, to toil for weeks through its sand, alkali and prickly bushes, revel in its curios and rare flora, gaze upon its grand yet gloomy scenery, and bring away—beside the characteristic products of the basin—a train of vivid, treasured memories of strange scenes and striking adventures in that wonderful sun-scorched land—a veritable *tierra caliente*!

The Great Basin.

The great basin of America is the bed of the evaporated Mediterranean sea of the western continent. Situated on the same parallels as its Eastern prototype, bordered like that on all sides with high ranges of mountains, it differs from it in two particulars, which render the one a very salt sea and the other a very salty desert.

The Mediterranean sea fills a deep chasm in the earth's crust 2,000 to 6,000 feet deep; lying between 30 deg. and 46 deg. north lat., and almost constantly swept by the dry winds of the great Sahara, its waters are evaporated at an immense rate, which would, ages ago, have emptied its basin but for the other important fact, the Strait of Gibraltar, through which a strong current ever comes from the ocean; and this, in addition to the mighty rivers which empty into the sea, and all to restore the equilibrium disturbed by evaporation. To this evaporation—this lifting of a sea into the air—is Europe indebted, mainly, for its exceeding fertility. The dry South wind is a sponge which takes up the waters of the Mediterranean and, condensed by the cold summits of the mountains of Europe, showers its waters over the plains. To this fact also is due the intense saltiness of the Mediterranean, for salt is the residuum of evaporation.

The Mediterranean desert of America is elevated about 5,000 feet above the ocean, so its waters would naturally sink in the earth. Then there are no mighty rivers feeding it, much less a Gibraltar strait, bringing in a flood from a neighboring ocean.

The towering rim of mountains on the West prevents the moist winds of the Pacific from entering the basin; the lofty Eastern rim bars out the Gulf winds; the lower North and South rims admit only the hot, dry, South winds of the Colorado to sweep over the basin, absorbing at their founts the few meager springs that rise in the mountain borders; so we have an immense frying pan or bake oven, as if scooped out of the highest mountains of North America.

It is oblong-elliptical in shape. Its western end rests upon the snow-clad Sierra, the eastern upon the lofty Wasatch range—a spur of the Rocky mountains. On its smooth bottom are ranged, side by side, steep ranges of mountains running north and south, like cross-bars of a gridiron. The highest of these, the Humboldt range, divides the basin exactly in the center, and the short rivers running from the mountains on all sides form sinks or salt lakes in each end, to which numerous systems of hot springs add alkali, sulphur and other minerals, so that the sinks are generally extremely offensive.

The most important rivers of the eastern depression are Bear river, on the north, and Sevier on the south, each emptying respectively into Great Salt Lake and Lake Sevier. The rivers of the west end are Humboldt and Susan on the north, debouching respectively into Humboldt sink and Honey lake; and Walker, Carson and Truckee on the south, filling respectively Walker, Carson and Pyramid lakes—the latter of which we propose to visit.

—And now, dear readers, who went with

us last year to Tahoe, the Big Trees, Yosemite and the silver minns, please

"Jump into the wagon and we'll all take a ride."

No fear of crowding the Professor. Only tell him plenty of stories and he will gladly walk. And you must allow me the privilege of walking too, to gather and study the plants by the way. See here, before getting out of Sierra valley, what beautiful specimens of the four new *Astragalus*, viz: A. Lemmonii, A. Pulsiferæ, A. Webberi and A. (unnamed), each particularly abundant along the bottom and sides of Beckworth pass, as if the seeds were sown here by the water current surging through here ages ago.

Flora of the Great Basin.

Emerging through this cleft in the high Sierra, and coming into full view of the shimmering basin below, with the snow-tipped Humboldts in the distance, I will leave you to contemplate the scene, while I pick up this desert plum, *Prunus Andersoni*, this worm bush, *Sarcobatus vermiculatus*, the first of the desert plants met with on the down grade.

Here on the floor of the basin, radiant with beauty, grows the only plant Dr. Gray will allow named for him on the western continent, *Grayia polygaloides*. It is a bush two to five feet high, densely crowded with spikes of flat circular pods, half as large as five-cent coins and red as cherries; "neat but not gaudy," is the Doctor's apt description.

A large part of the flora of the basin belongs to the order of *Chenopods*, or the goose-foot family, distinguished by their thick, hairy, succulent leaves, often shiny stems, and the extreme loneliness of the entire order, with the exception of the *Grayia* mentioned. The order most numerous is the one everywhere most abundant, found on every spot where vesicular plants may thrive, the immense order of *Compositæ*, or sun flower. This order comprises about 10,000 species, and forms, according to Humboldt, one-ninth of all the flowering plants of the globe and one-half of its tropical flora.

Chief among this order in the basin is the renowned "sage brush," a name loosely applied to several kinds of plants having the same ashen hue, and found on the great arid plains from the forest-clothed slopes of the Sierra to the bottom lands of the Missouri.

Whether the order or genus, all is modified to conform to the requisites of this hot region; thick leaves to hold the moisture when the sun is high; copious, non-conducting hairs, to prevent exhalation; sharp, forbidding spines, to ward off enemies of the animal kingdom. This spinescent character is most puzzling to the reflecting mind. What need of such protection in a region so desolate, so unfrequented? The rich open prairies and forests of other lands invite population. This arid, seemingly waterless basin is clothed, except where bleak alkali and salt deserts prevail, with dense, thorny, almost impassable sage brush, as if to guard a priceless treasure. And Darwin says it is so. He affirms that here are reservoirs of elements now unfit for use, which the art of the coming man will turn into verdant forests or beautiful fields, as the needs of a teeming population will demand. Corroborative of this theory, most wonderful vegetable growths are now seen in the valley of the Jordan, filled by the devoted Mormon, and in the valley of the Cerson, verdant with alfalfa; both of these valleys immensely changed in value as the result of irrigation skillfully applied and on a large scale. But I must bury you or you will leave me pondering here in the sand.

The first of the valleys between the cross-bars of the gridiron is Long valley, threaded in winter and spring by Long Valley creek, rising near Reno and running north to Honey lake. Passing down it 25 miles we turn eastward through a cattle range enclosed by a fence of matted willows, climb the first ridge and Soda Lake valley is before us. The lake is a yellow pool of salt, alkali and sulphur. Crossing to the second ridge and climbing it, we look over into Winnemucca valley. On the pass at our feet is a beautiful *Scutellaria nana* (Gray), a new species. It maintains its green, robust look by means of reservoirs of plant food stored in its thick, necklace-like, subterranean stems. The next is Warm Spring valley, quite large and important. Through it passes the road from Reno to Snrpriss valley and Fort Bidwell. Passing around a sand mountain, gemmed with rare *Eriogonum*, we ascend an arm of Warm Spring valley, move over a high pass and drop into a valley so walled in with sheltering ridges as to afford a surprisingly large and varied flora.

Every mile of our progress to this point has been marked by decreasing verdure and the appearance of the peculiar ashen, dwarfed, desert plants. But here in this little valley all the species met with on the way are crowded, while hosts of strangers appear. In rapture, I named it for the veteran botanist,

Gray's Valley.

Here in this secluded garden of the great basin is the natural home of the eend and sun-loving plants, too numerous to name—all putting on their gayer apparel and exhaling the richest perfumes, as if to prove the oft quoted lines:

Full many a flower is born to blush unseen
And waste its sweetness on the desert air.

Here flourishes *Tetradymia spinosa*, with strong, hooked prickles; the monster *Thellipodium*, four to six feet high. Up on the hot sand bluffs stands, sentry-like, the scrubby crucifer *Stanleya pinnatifida*, with spikes of yellow flowers 18 inches long, terminating up-

right; white limbs four to six feet high. On the clean eend by our feet nestles the curious *Coldenia nuttallii*, the purple *Conanthus aretioides*, the yellow *Emmenanthe glandulifera*, the sneaked-like *Anisocoma aculea*, and several species of the ever beautiful *Eriogonum*; but most striking of all uprears the rare *Abronia Cruz-Maloe* of Dr. Kellogg, holding at arm's length its large balls of pink flowers. Over the dry watercourse, *Oleome lutea* peers; from the rocks on each hand hang *Pentstemon* and *Arenarias*, while the gorgeous *Eschscholtzia* shows its red eyes between the clefts, and the immortal *Levisia rediviva* on the gravel above espies to notice by creeping to the edge of the precipice.

This plant is well named *rediviva*. Roots gathered nearly two years ago are growing still in their papers despite heavy pressure, illustrating the power with which they are endowed to resist the severities of the basin climate. Deep rooted in the volcanic ashes of yonder heathen glows *Opuntia pulchella*, the prettiest of the *Cacti* family, and that odd little stiff-leaved, crimson *Oxytheca perfoliata*. Under the spiny hushes of *Bignonia graveolens* carpeting the whole valley, are seen a few plants of *Pectocarya pentellata* strayed away from the coast, and *Blitum carinatum*, only found before in Australia.

(The uninitiated reader will please pardon these hard words, for we are on a botanical excursion and this is Gray's valley. I have not afflicted you yet with *Cosmanthoides infundibuliformis*, nor *Platyachne integrifolia*, much less *Gliesbreghtia grandiflora*, so give me credit for a little cherity.)

But we must not linger in this flowery vale. The dry water course along which our road passes grows wide and precipitous. Through the gorge ahead appear the dim peaks of the Humboldt. A great valley must be near, and our map tells us it contains one of the goals of our long journey—

Pyramid Lake.

From a high bluff on the west side we come into full view of this vast, gloomy, awe-inspiring sea, low sunk in its long, sandy, volcanic bed. First, before even a sweeping glance, taking in the whole grand scene, the eye rests enchanted upon a pair of objects directly in front. The heart throbs violently. You can scarce believe your eyes. You must be transported to Egypt, for there are the *Pyramids*! The nearest, square-sided and true as if hewn with masonic skill, towers up 300 feet from the apparent center of the lashing waves. The other completes the Egyptian picture by presenting a flat-topped area, which a nearer view reveals white with thousands of pelicans. It is these wonderful symmetrical monuments which give the lake its name. It could bear no other. Even the Pinte name, *Pe-nock-thou*, refers to the pyramids.

Pinte Reservation.

Touching the south end of Pyramid lake is a small, green, pear-shaped mass of what appears to be willows. A journey of 30 miles towards it would show a large forest of cottonwoods, carpeted with grass and flowers fostered to a rank growth by the sediment brought down from Tahoe lake and the valleys between by the Truckee river, which pours its torrent ceaselessly into this engulfiog, but never disgorge, sea. This rich bottom land—the delta of the Truckee—with a large region round, including the whole of Pyramid lake and its shore for a mile inland, is reserved by the government for the occupation of the Pinte nation. The agency buildings are built in the shady grove, and hundreds of "wickens" are scattered among the trees. Willow fences enclose the richest lands, and the Indian is instructed to till them, but Mr. Pinte finds it too much like work. So he lives mainly upon trout caught in the lake, rabbits hunted in the sage brush and supplies dispensed from the agency. The number of Indians differs constantly, owing to their migrating habits, from only a hundred to often a thousand. Excessively fond of gambling and whisky, they are fast perishing away.

As we proceed along the bluff on the west side of the lake, going northward, more wonders appear.

The Sunken City.

From behind a jutting sand dune an assemblage of splintered rocks of similar formation to the pyramids rise abruptly from the sea, instantly suggesting a sunken city. A day's travel towards them increase their size to that of immense fortifications, battered and torn into all manner of shapes. You can count over 50 of those rocky islets standing there in the sea, so black, so splintered, so suggestive of human agencies, that you rub your eyes and think in order to realize that you are not in Italy. And this resemblance to human structures is heightened by the entire absence of anything like them in all the enclosing mountains. They seem foreign to the country. The far Eastern shore, dimly seen across the dark sea, looks a bare, sandy plain, stretching away to nearly as bare and brown mountains that limit the view. Not an oasis, not a patch of verdure save scant ribbons of salt-grass that do not deserve the name of meadow, and the cottonwood at the reservation, appears in all the horizon. Can any scene on this continent be more drear? How different, how opposite this lake and its scenery compared with its mother—the matchless sea from which its waters come—the far-off, mountain-supported, forest-rimmed, cloud-curtained, sky-hued Tahoe!

Pyramid Contrasted with Tahoe Lake.

No two objects in nature of the same name,

probably, can present so many contrasts as Tahoe and Pyramid lakes; the one pouring its pure, wholesome waters by the Truckee river into the filthy sink of the other; the one elevated 6,420 feet above sea level into the cool cloud land, the other depressed 3,000 feet into the treeless plain, scorched by the glaring sunlight; the one bordered by bright meadows and dense evergreen forests, the other rimmed by alkali flats and hold reaches of sage brush; the one a source of unmeasured wealth to the cities of Nevada through its forest and meadow products, the other utterly worthless, a horrid incubus resting upon the fair face of the State; the one attracting to its shores on all sides thriving villages occupied by cultivated and happy people, the other presenting a smooth shore-line of 120 miles, broken by only one little grove of cottonwoods, the wretched shelter of a small herd of savage, vanishing Pintes; the one flocked with the white sails of the pleasure boat and striped with the broad trail of the passenger steamer, the other unrelieved through all its expanse save only a few Indian canoes and thousands of homely pelicans riding its turbid waves; the one the far sought resort annually of hundreds of invalids whom but its miraculous climate can restore, the other only visited per force, by the ranchman who must enter this malarious valley in search of roving stock; the one inspiring with the grandest thoughts by its sublime scenery, the other depressing almost to nausea by the monotony of its surroundings; the one raising the soul up to a conception of the might, perfection and benevolence of the Creator, the other tempting the reason to distrust the wisdom of a Being who could have need of any such odious thing in his process of world-making; the one a glimpse of Paradise, the other a vision of Hades; the one a jewel, the other its dross; the one light, the other gloom;—life—death!

[To be Continued.]

The Wallace & Ferguson Mine.

A correspondent at Sheep Ranch furnishes the *Calaveras Chronicle* with the following history and description of the celebrated Wallace & Ferguson mine, located at that place. It will be read with interest: As I have been at the Sheep Ranch of late I thought I would drop you a few lines in regard to the Wallace & Ferguson claim.

It is 1,600 feet in length; average width, from 16 to 18 inches. The course of the ledge is nearly east and west. The claim was first located by Messrs. Ferguson & Smith, eight years ago, as an extension of the McNeir claim. At that time the nearest mill was at El Dorado, seven miles. For illustration I will say they commenced in the woods end darkness, but Ferguson, satisfied with the prospect he had, knew that daylight was ahead, and that he would in time step into it by close attention and economy in the management of prospecting the claim. The Smiths sold out five years ago to Mr. Wallace, a man who pays strict attention to business and always keeps on the safe side. Now for a further description of claim. It has been worked 1,600 feet in length, to a depth of 100 feet on an average, which paid, from top down, from \$60 to \$70 per ton. The lowest yield of a week's run of mill was \$33 per ton. They now have a 50-horse power engine at work. Mr. Trump, of San Andreas, planned and built their hoisting works, which, as far as I am a judge, are as perfect a piece of work as can be. They are now sinking the shaft below the old works, contemplating reaching a depth of 125 feet. It was 95 feet deep when I left, and as they go down the rock grows richer and richer—good for \$100 per ton. This work is near the center of the claim. Think of 1,600 feet in length, 18 inches thick, 125 feet deep and good for \$100 per ton—which is a certainty. The claim wants no blowing. The yield of gold it has given for years tells its own story. They have a five-stamp battery or mill, which is kept in constant motion.

The "Ranch" has two stores, kept by Messrs. Hughes and Dughi, 13 families and quite a number of unmarried men.

CALIFORNIA CAR WHEELS.—A set of wheels were taken from beneath the baggage car of the California and Oregon express train at Sacramento, Tuesday, which had traveled in daily use 91,800 miles, and they were not worn out then, but had become loose on the axle. A few weeks ago a set was taken from beneath the same car that had traveled about 80,000 miles, and there are yet remaining under the car two more sets, put in use at the same time as those mentioned above, and yet so little worn that they probably will not have to be removed for months. All of the wheels were cast at the railroad foundry in Sacramento, and reflect much credit upon that institution.

N. P. R. R.—The engineer corps of the North Pacific Coast railroad company is now operating between Freestone and Valley Ford, surveying the original location. About the 1st of March a grading force will be put on that portion of the route, and the road bed will be completed to Freestone in time for the iron, which is expected to arrive about the 1st of July. The road will be completed through Dutch Bill canon and down Russian river to Duncan's Mill by the 1st of November.

EGYPTIAN IRRIGATING APPLIANCES.—It is stated that 30,000 *sakias*, or water wheels, and 70,000 *shadoofs* (which is a long pole placed on an upright post, with a bucket at one end and a weight at the other) are constantly at work in Egypt Proper.

MECHANICAL PROGRESS.

A New Photographic Printing Process.

It is well known that a layer of gelatin containing bichromate of potash, or the so-called bichromate of gelatin, possesses the property of becoming insoluble by the influence of light. If a glass plate is covered with such a layer and exposed to the sun or to daylight under a negative, the places exposed to the light become insoluble, and those protected or shaded will remain soluble, and may afterward be water-soaked, while the insoluble portions will remain dry, and thus having the advantage of taking up the oily printing ink, such a plate can be used as a lithographic stone and printed from in a lithographic press; this is one of the known methods of photo-lithography. Other modes have been invented, intended to prepare plates in such a way that they become similar to wood-cuts, and may be printed on a common press. Some of them are now in use in this country, but the simplest and best is perhaps the method of Despaquis in France, lately published, and chiefly intended for manufacturing purposes. Instead of a glass plate, he uses a corresponding large belt of linen, on which he places the layer of bichromate of gelatin, develops the image in the usual way, removing that part of the gelatin which has remained insoluble as much as possible, he then sews the ends of the belt together, and stretches it between two pulleys, while by the addition of a little glycerine the whole is kept flexible and prevented from drying hard. On one of these pulleys, revolving by steam power, the belt is inked by an inking roller; by the other pulley the pressure is produced on an endless strip of paper or other material which thus receives a continually repeating impression of what there is on the belt. It is proposed to accomplish in this way the reproduction of photographs in a cheaper way than thus far has been possible by any other method, while the use of the principle to print new patterns of calicoes, wall-paper, etc., forms another new industrial novelty.—*Manufacturer and Builder.*

Covering for Boilers and Steam Pipes.

As much inquiry is being made for the best non-conducting substances for covering steam boilers, pipes, etc., in addition to those already given we add the following: The German *Journal of Wooden Manufacturers* suggests that where the material is convenient mix fuller's earth, that has been used and collected in sinks for this purpose, as well as to prevent the filling of streams, with fully the same quantity of coal ashes, and add to the paste mass as much calf's hair as it will take up. Before laying it on add one-eighth its quantity of calcined gypsum, and lay it on in thin coats. If the first layer does not adhere well, unused fuller's earth may be used for it.

Mr. Krupp, of Prussia, has applied largely, at his steel works in Essen, iron furnace slag with highly satisfactory results. It is incombustible, and altogether appears well adapted for its purpose as a non-conductor of heat. It is made at the large furnaces for converting the ironstone into pig iron, where the slag is kept continually running out at a small opening, about one inch in diameter. From thence it travels through an open spout, and falls from the end about 30 inches, at which point a pipe coming from the blast chamber is fixed. The rush of cold air, coming in contact with the melted slag, drives it into thousands of fine hair-like threads, resembling fine spun glass, or asbestos. Although it has much the appearance of cotton wool, the fine points of the fibers, if much handled, pierce the skin like so many fine needles. The material is being introduced in England.

Utilizing Coal Dust.

Three or four months ago the experiment was first tried of using coal dirt, in place of coal, in raising steam for the purpose of pumping water into the reservoir of the Philadelphia and Reading company, North Sixth street. It proved a complete success. From three to four tons of coal had been used each 24 hours, and with the same quantity of coal dirt, even more steam was raised than before.

Coal dirt was next used under the two cylinder boilers in the iron car shop of the railroad company, south of Chestnut street, and it did admirably. By using a quantity of dirt equal to the amount of coal formerly consumed, more steam was raised than before.

The large tubular boilers in the machine shop, between Chestnut and Franklin, are now also supplied with coal dirt, and it answers the purpose, though, owing to the tubes, the draft is not as strong as that in the cylinder boilers, where such a powerful draft can be obtained that the flame will strike out of the top of the smoke stack. Under all these boilers the very best anthracite coal was formerly used.

An *Eagle* reporter has been informed that it is the intention of the railroad company to use coal dirt wherever they have stationary engines, and it is being tried in one of the locomotives on the railroad, with a fair prospect of success. In burning coal dirt, steam is introduced into the furnace through the grate. The improvement is said to be the invention of the general superintendent, J. E. Wooten.—*Reading Eagle.*

Cutting Steel With Soft Metal Discs.

Prof. B. S. Hedrick, of Washington, read a paper at the Detroit meeting of the American Association for the Advancement of Science, explanatory of the mode and the essential character of the operation by which soft iron is made to cut hard steel. The development of heat by friction has been known for ages. A more recent discovery is that the operations of rolling and rubbing have the effect of changing the molecular structure of iron and steel, toughening and rendering more compact even cold iron and hardening as well as softening steel. Mr. Jacob Reese, of Pittsburg, Pa., had been endeavoring to construct a machine to cut hardened cold steel. He accomplished it at length by means of a soft iron disc rotating at high velocity. With low speed this would not cut at all; but when running at about 25,000 feet per minute the disc cut through steel rapidly, giving out an immense cascade of sparks in the operation. It was found on examining the debris beneath the disc that the particles of steel were not simply rubbed off. They were welded together in a pyramid like a stalactite or the snow icicles formed on the top of Mount Washington. Prof. H-drick ascertained that real fusion had taken place among the particles of steel. The disc is very little heated, but the steel is actually melted and drops down. Yet the heat on each side of the cut is not heated enough to draw the temper or oxidize the metal. Solid bars of steel of two inches or three inches in diameter are thus cut through in as many minutes. The soft metal disc is about 42 inches in diameter. The naked hand may be passed through the jet or stream of flying sparks during the operation without being burned, since the particles of melted metal are in the condition known as the spheroidal state.

NEW EXPLOSIVES.—A new explosive compound has been introduced in Europe, and the name of "Vigoris" has been given it. It is formed of 25 to 50 per cent. of nitroline, nitrate of potash 15 to 25 per cent., chlorate of potash 10 to 30 per cent., and 15 to 35 per cent. of cellulose. Another explosive recently invented by Trautzschler Falkenstein, and apparently made of woody fiber prepared with nitro glycerine, has been recently tested in various mines in Upper Silesia. The results were on the whole not unfavorable, but the action was not always regular. The substance has not (as was at first claimed for it by the inventor) five times the force of an equal weight of ordinary black blasting powder, and even four times was doubtful; but a three-fold force may be readily conceded. The advantages of the new agent are, less danger, as it does not explode on contact with open fire, and is but difficultly exploded by friction or concussion; and the fact that, to effect its explosion in a blast hole, the strand match may be used. The powder is very light, and in the loose state burns very slowly. A manufactory for the new agent has been established in Kietzsch. This explosive, it will be seen, is similar to giant powder—a vegetable fiber instead of a mineral powder being employed as a carrier for the nitro-glycerine.

LOCK WELD ANVILS.—Messrs. B. W. Baldwin & Co., of Pittsburg, have lately begun the manufacture of an anvil that, according to *Iron Age*, promises to rival those of English make. The anvil is wrought iron with steel face, but the special improvement consists in the lock weld anvil being generally made in two parts, and these welded together with a broad, flat weld. This process of welding often proves deficient, the fiber of the iron not being joined, but fiber placed on top of fiber, not a weld but a cement of the two parts, which, when the anvil is put to a severe test, too often breaks in the shank, becoming worthless. The American anvil works make the lock weld or wedge shape. In the bottom of the anvil there is a deep groove, the top has a V shaped projection that fits in the corresponding groove bottom. When the weld is made the fiber meets, interlocks and forms the most perfect weld that can be made with iron. Another improvement in the American anvil is, the top block is made from plates welded together and placed on edge, not flat as is customary with other manufacturers. The face of the anvil is made from a thick steel plate of the best quality.

THE NUMBER OF BESSEMER STEEL WORKS IN THE WORLD.—Great Britain has now 21 Bessemer steel works, with 105 converters; Prussia, 14, with 61 converters; Austria, 12, with 30 converters; Bavaria, two, with four converters; Saxony, one, with four converters; Alsace, one, with two converters; France, eight, with 25 converters; and the United States, 10, with 20 converters. These totals make up an aggregate of 71 works, with 251 converters, representing an annual productive power of 2,500,000 tons.

THE FUTURE OF PETROLEUM.—Although petroleum is not iron, it is so closely connected with it that its ups and downs have a very marked effect upon certain forms of iron and its manufactures. Tubing pipe, steel for tools, engines, boilers, pumps, tank iron, rivets, hoops, all enter largely into producing, refining and transporting carbon oil; in fact the consumption for this purpose demands the larger part produced of some classes mentioned. This fact gives the iron trade an interest in the future of this product.

SCIENTIFIC PROGRESS.

How the Sky Looks to "The Man in the Moon."

If there could be such a thing as "a man in the moon" he would see such "sights" in the heavens as we, upon the earth, have very little idea of. A late writer in the *British Quarterly* has been indulging a little in this kind of imagination, and this is the way he puts it:

"At last, however, night sets in. Gradually it comes, after the sun has gathered up his smiting beams and gone down to rest. At all once we are plunged into comparative obscurity, for again there is no twilight to stay the steps of departing day. But looking up into the sky we behold a vast orb which pours down a milder and more beneficent splendor than the great lord of the system. It is such a moon as we terrestrials cannot boast, for it is not less than 13 times as large and luminous as our own. There it hangs in the firmament without apparent change of place, as if 'fixed in its everlasting seat.'

"But not without change of surface. For this great globe is a painted panorama, and, turning around majestically on its axis, presents oceans and continents in grand succession. As Europe and Africa, looking the Mediterranean in their embrace, roll away to the right, the stormy Atlantio offers its waters to view, and then the two Americas, with their huge forests and vast prairies, pass under inspection. Then the grand basin of the Pacific, lit up with island fires, meets the gazer's eye, and, as this glides over the scene, the eastern rim of Asia and the upper portion of Australia sail into sight. The Indian ocean, and afterward the Arabian sea, spread themselves out in their subdued splendor, and thus in 24 hours the great rotundity we tread turns its pictured countenance to the moon, and gradually repays the listening innuants by repeating to the best of its ability the story of its birth.

"Nor is the sky less marvellous in another respect. For the absence of any atmospheric diffusion of light permits the constellations to shine out with a distinctness which is never paralleled on earth. They glitter like diamond points set in a firmament of ebony. Stars and clusters which we never see with the naked eye, flock into view and crowd the lunar heavens."

HOW PLANTS ABSORB NITROGEN.—Of late there have been some remarkable discoveries in regard to the manner in which plants take in the nitrogen which they contain. It was thought to be certain they did not absorb it through the leaves from the atmosphere; but Mr. Darwin has shown, in regard to insectivorous plants, that these, at least, do. And he has further shown that some plants, with glandular hairs, take in nitrogen through them, besides making it probable that to supply the plant with nitrogen is the office, in a general way, of all glandular hairs. Since that time Dr. Gilbert, of the celebrated firm of Lawes & Gilbert, agricultural chemists of England, has published a paper on the source of nitrogen in some fungi. Mushrooms in general abound in nitrogen; and, as they appear so often in immediate connection with some kinds of nitrogenous manure, nothing was easier than to infer that the mushroom family fed on manure. But Dr. Gilbert's experiments show not only that some fungi of this class grew in soil entirely deficient in nitrogen; but that the health and vigor of these mushrooms were just in proportion to the absence of the nitrogen from the soil. It now becomes an interesting question as to how fungi obtain their nitrogen, and the solution will probably be, as in the case of Mr. Darwin's insectivorous plants, that they obtain it from the atmosphere.—*Ex.*

A THOUGHT ON ASTRONOMY.—Other stars, like our sun, undoubtedly started as vaporous masses, and have thrown off planets in contracting. The inference may seem a bold one, but it after all involves no other assumption than that of the continuity of natural phenomena. It is not likely, therefore, that the solar system will forever be left to itself. Stars which strongly gravitate towards each other, while moving through a perennially resisting medium, must in time be drawn together. The collision of our extinct sun with one of the Pleiades, after this manner, would very likely suffice to generate even a grander nebula than the one with which we started. Possibly the entire galactic system may, in an inconceivably remote future, remodel itself in this way; and possibly the nebula from which our own group of planets has been formed, may have owed its origin to the disintegration of systems which had accomplished their career in the depth of the bygone eternity.

SCIENTIFIC PROGRESS.—We live in an age of progress and discovery; theories that were at first entertained as doubts have been developed into facts. We see on every hand the indications of advancement; one discovery culminates in another; each generation furnishes its idols of genius; the man of science whose knowledge is power points out the results of research for the universal welfare; facts that are startling are constantly met with in this higher state of civilization; scientists that were at first looked on as mad enthusiasts and fit subjects for scorn and contempt, are now recognized as benefactors to the human race.

Bacteria Found in the Perspiration of Man.

Dr. Eberth, of Zurich, Switzerland, has found, says the *Medical Record*, by the aid of the microscope, in the sweat of the face some corpuscles which he considered as bacteria. This view became confirmed when he examined the axilla, breast, and inner side of the thigh of several persons in a state of perspiration. The sweat of these parts contained nearly always enormous numbers of bacteria. In most cases they originated from minute bodies found upon the hairs in the mentioned regions, forming little nodules on them, and giving them a grayish or a brick color. They were recognized by the author as accumulations of micrococci. They may rapidly increase in number, are smaller than diphtherial micrococci, and are nearly indifferently to re-agents (concentrated acids, alkalies, alcohol, ether, chloroform). Iodine colors them yellow. The vegetation of bacteria on the hairs may be observed in cases where they are changed already, beginning in places which have clefts between their cells. The vegetation occupies large spaces, especially in the direction of the longest diameter of the hair.

Dr. Eberth observed a mycelium and micrococci, and thinks that the latter are the fruits of the former. Other investigators observed colored sweat, red and blue, which contained micrococci. It was difficult to decide in these cases if the coloring matter was adherent to the micrococci, or if it was a product of the vegetation.

Interesting Mineral Specimens.

Henry S. Poole, Government Inspector of Mines for Nova Scotia, says that in the collection of minerals to be sent to the Centennial exhibition, from Nova Scotia, there is a specimen of lead ore which shows that the mineral has infiltrated the tissue of some red-like plant of the carboniferous age. It is from the surface soil near Arisaig Pier. No pieces have been found *in situ*. Associated with the fragments discovered are others mineralized by iron pyrites, somewhat similar to those found in the shaly portions of coal seams. Galena is known in other parts of the world to appear in coal, but, as far as the writer knows, never before as a mineralizing agent of vegetable structure.

A further interesting discovery of galena was made at Port Hood, Cape Breton, where a small vein of calcite, containing massive crystals of galena, was found in the sandstone lying between two seams of coal, but no specimens similar to those of Arisaig were found. As they are possibly new, and consequently of interest, this notice has been submitted at the suggestion of Mr. Trautwine.

Whether new or not, such specimens are of some value as confirming the theory of the aqueous origin of some mineral veins, for although the blast furnace has proved that galena can be volatilized by heat and recrystallized on cooling, the finding of galena in places where it could not possibly have been exposed to a high temperature requires some other agent than heat to account for its aggregation and deposition, and suggests the universal medium of solution, water, as the agent.

IMPORTANT TO BOTANISTS.—A French gentleman, M. Boudin, has discovered that if freshly gathered plants are spread out between sheets of filtering paper in the usual herbarium manner, and then heated between two bricks in an oven for two or three hours at about 150 deg. Fah., they will be perfectly and permanently preserved without impairment of the most delicate colors. The process is rendered more rapid and certain if the layer of filtering paper next the flowers be changed after about an hour.

PHOTOGRAPHY.—On the 2d of October, 1839, Daguerre took his first picture in public—before many of the members of the Society of Fine Arts. It represented that part of the Tuilleries known as the Quai Voltaire, on the other bank of the Seine. It has been presented to the French Conservatory as an interesting record of art and of Paris of the past. The Tuilleries is in ashes, and although but 36 years have passed, changes have come so quickly in art that the younger generation scarcely knows what Daguerre means.

VERY MINUTE ANIMALS.—When Lieutenant Berryman was sounding the Atlantic, preparatory to laying the ocean cable, the quill at the end of the sounding-line brought up mud which, on being dried, became a powder so fine that on rubbing it between the thumb and finger it disappeared in the crevices of the skin. On placing this dust under the microscope, it was discovered to consist of millions of shells, each of which had a living animal.

A NEW MINERAL.—Prof. J. W. Mallett describes in the *Journal of the Chemical Society* a new molybdo-oxide of lead, from Mexico, for which he proposes the name of achrematite. The mineral is compact, and here and there indistinctly crystalline. Color, liver brown; luster, between resinous and adamantine; specific gravity, 6.17, hardness, 3.5.

THE ACTION OF SALIVA.—M. Petit recently communicated to the Société de Pharmacie of Paris the results of his experiments on saliva. He had found that one gramme of tyline had the power of dissolving from 10,000 to 20,000 grams of starch, producing a quantity of sugar varying between 3,500 and 7,000 grams.

Compiled every Thursday from Advertisements in the Mining and Scientific Press and other S. F. Journals.]

ASSESSMENTS.—STOCKS ON THE LIST OF THE BOARDS.

Company.	Location.	No.	Amt.	Levied.	Delinq't.	Sale.	Secretary.	Place of Business.
Alb. S. M. Co.	Worcester.	2	50	Jan 87	Mar 8	Mar 85	W. H. W. H.	200 Main

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.

Alameda Coal M Co	Cal	1	100	Feb 2	Mar 15	Mar 31	R F Bridge	409 Sattery st
Albany Quicksilver M Co	Cal	1	100	Feb 2	Mar 15	Mar 31	J C McQuinn	113 Leidesdorff st
Alameda Coal M Co	Cal	1	100	Feb 2	Mar 15	Mar 31	H M Morgan	331 Leidesdorff st
California Watch Co	Alameda Co	Cal	1	500	Mar 8	Apr 8	H T Graves	130 Sutter st
Cibola M Co	Utah & Cal	1	30	Jan 17	Feb 25	Mar 17	F P Reynolds	11 1/2 Leidesdorff st
Comstock Refining Co	S F	5	50	Jan 22	Mar 9	Mar 23	D Miller	320 Sansome st
Comstock M Co	S F	3	50	Jan 29	Feb 25	Mar 16	H C Kearny	83 Kearny st
East Branch M Co	Plumas Co	Cal	4	25	Jan 24	Apr 6	A Martin	821 Sans me st
El Dorado W & G M Co	Cal	13	200	Feb 9	Mar 11	Mar 27	Hugh Ellis	427 Montgomery st
Electric M Co	S F	4	10	Jan 26	Mar 9	Mar 25	A B Paul	318 California st
Elgin Stone Manufacturing Co	S F	3	10	Jan 26	Mar 9	Mar 25	J D Jewell	412 Market st
Excelsior Quicksilver M Co	Cal	4	5	Feb 23	Mar 24	Apr 13	A Halsey	200 Sansome st
Florida M Co	Washeo	4	1	100	Feb 7	Mar 15	L Herman	339 Pine st
Fresno Quicksilver M Co	Cal	2	15	Feb 29	Apr 7	Apr 28	R Wegener	414 California st
Golden Gate M Co	Butte Co	Cal	2	25	Feb 1	Mar 6	J P McQuinn	311 California st
International G M Co	Cal	2	25	Feb 1	Mar 6	Mar 25	J W Buffington	311 California st
Iris M Co	Cal	30	Feb 15	Mar 21	Apr 18	F Madge	Merchants' Ex	
Junata Con M Co	Nev	4	25	Jan 26	Feb 29	Mar 18	A Barra	304 California st
Castle Idaho Coal M Co	Washeo	2	25	Feb 1	Mar 6	Apr 20	W J Townsend	270 Pine st
Josephine Gravel M Co	Cal	10	Feb 3	Mar 25	Apr 10	W Small	531 California st	
Kelsey T & S M Co	Cal	15	5	Feb 6	Mar 27	J H Sayre	311 Montgomery st	
Klamath Quartz M Co	Cal	300	Mar 2	Apr 10	May 2	J F Nesmith	315 California st	
London Quicksilver M Co	Napa Co	Cal	4	100	Feb 24	Apr 10	H C Kearny	224 Sansome st
Mariposa Land & M Co	Cal	4	100	Feb 23	Mar 21	Apr 12	L Leavitt	Nevada block
Monumental Q M Co	Cal	5	5	Feb 8	Mar 18	Apr 15	Wm H Martin	328 Montgomery st
Monroe S M Co	Utah	3	10	Feb 24	Mar 31	Apr 20	D F Verdental	409 California st
North Chipman & Smelt'g Co	Cal	10	Mar 3	Apr 6	Apr 20	Apr 20	W H Martin	409 California st
North Chipman M Co	Washeo	1	10	Mar 3	Apr 6	Apr 26	J Macuire	419 California st
Ocean View Quicksilver M Cn	Cal	1	50	Feb 12	Mar 21	Apr 15	D Buck	Nevad a block
Omega Tube M M Co	Cal	9	Feb 4	Mar 13	Apr 13	Apr 22	D Wilder	Merchants' Ex
Olympia R & M Co	Oregon	1	100	Feb 15	Mar 3	Apr 19	W H Martin	Nevada block
Paradise Oans M & M Co	Cal	1	5	Feb 24	Apr 4	Apr 22	W F Bozart	323 Montgomery st
San Jose M Co	Nev	10	500	Dec 10	Jan 17	Feb 29	A Carrigan	105 Front st
Sheets S M Co	Cal	4	10	Feb 2	Mar 3	Mar 23	A Halsey	200 Sansoms st
Superior G & S M Co	Washeo	5	Feb 8	Mar 3	Apr 10	Apr 20	L Seaton	236 Montgomery st
Union M & S M Co	Cal	10	10	Mar 4	Apr 5	Apr 26	L Hallett	3, 9 Montgomery st
West Point G & S M Co	Washeo	1	10	Feb 3	Mar 5	Mar 20	David A Jennings	401 California st
West Point G & S M Co	Cal	3	10	Feb 23	Mar 31	Apr 14	L Napolin	Merchants' Ex
Wymong G M Co	Cal	3	10	Feb 8	Mar 3	Apr 14	J W Buffington	311 California st
Yuba Quartz M Co	Nev	3	30	Feb 18	Apr 22	Apr 22	R H Miller	412 Montgomery st

Name of Co.	Location.	Secretary.	Office in S. F.	Meeting.	Date
Alps S M Co	Washoe	O D Squire	Stevenson Bldg	Annual	Mar 20
Baltic Cons M Co	Nev	R L Thomas	419 California st	Annual	Mar 21
Cons Alabama M Co	Nev	H Lowrey	330 Pine st	Mar 21	Mar 21
Cons G S M Co	Washoe	Called by Trustees	370 California st	Special	Mar 22
Electro M Co	Cal	A B Paul	318 California st	Annual	Mar 26
Enterprise Cons M Co	Cal	F J Hermann	418 Kearny st	Annual	Mar 26
Electric Tunnel & M Co	Utah	H Hermann	Merchants Bldg	Annual	Mar 27
Hale & Norcross M Co	Washoe	Called by Trustees	Nevada Block	Special	Apr 13
Knickelbocker M Co	Nev	Called by Trustees	381 Montgomery st	Special	Mar 20
Knights G	Idaho	O B Hume	402 Montgomery st	Annual	Mar 13
Mexican M & Real Estate Co	Cal	Called by Trustees	328 Montgomery st	Special	Apr 13
Nonpareil G M Co	Cal	A DuPar	34 N Montgomery st	Annual	Mar 13
Pioneer M Co	Nev	R H Hume	402 Montgomery st	Annual	Mar 13
San Francisco Copper M Co	Cal	R De la Montagne	Cor Front & Jackson	Annual	Mar 13
Segregated Caledonia M Co	Nev	Called by Trustees	419 California st	Special	Mar 17
Ward G & S M Co	Nev	D M Sigurd	419 California st	Annual	Mar 23
W. F. Ford G & S M Co	Cal	D A Jennings	301 California st	Annual	Mar 23
Yellow Jacket M Co	Washoe	Called by Trustees	Gold Hill	Special	Mar 23

Name of Co.	Location.	Secretary.	Office in S. F.	Amount.	Payable
Alps S M Co	Ely District	O D Squire	Steven's on's Bldg	25	Feb 15
Belcher M Co	Washee	H K Kibbe	419 California st	1 00	Mar 10
Beck & Bear Quartz	Cal	W L Oliver	418 California st	50	Feb 25
Cone Virginia M Co	Washee	Chas H Fieb	401 California st	10 00	Mar 15
Empire M Co	Nevada Co Cal	D A Jennings	402 Montgomery st	75	Sept 15
Indian Queen M & M Co	Nev	E R Brow	309 Montgomery st	50	Dec 31
Leopard M Co	Nev	H Brown	402 Montgomery st	75	Feb 15
Northern Belle M & M Co	Cal	W Willis	402 Montgomery st	1 00	Feb 15
St Patrick M Co	Cal	D F Jordanal	419 California st	30 00	Mar 15
West Comstock G & S M Co	Washee	Oliver G Wood	543 California st	50	Feb 25

625	Leopard	.....	9@914	635	New York	.....	214@214
640	Lady Bryan	.....	3 1/2@3 1/2	1145	North Carson	.....	75@85
130	Meadow Valley	.....	3@3 1/2	300	North Con Vir	.....	57@60
135	Manassas	.....	2 1/2@2 1/2	100	Old Dominion	.....	40@42
25	Mansfield	.....	25@25	600	Prospect	.....	40@42
135	Northern Belle	.....	3@3	50	Pictou	.....	30@
135	New York	.....	25@25	25	Rock Island	.....	25@
200	New York	.....	2 1/2@2 1/2	200	Silver Hill	.....	114@114
220	Occidental	.....	4 1/2@5	500	Seg Caledonia	.....	24@
330	Panther	.....	3 1/2@3 1/2	80	S Justice	.....	2@
130	Park	.....	2 1/2@2 1/2	100	St Albans	.....	40@
150	Poorman	.....	40@50	500	Teler	.....	60@
5	Ray & Ely	.....	19@	140	Utah	.....	18@
100	St Patrick	.....	10@10	100	Wells Fargo	.....	612@66

It is a peculiar feature of this market that the Bonanza stocks have not advanced near in proportion to the other stocks. Many causes are assigned for this, but upon an excited market, like the present, they must be accepted with a certain grain of allowance. A curious feature of the market was the very rapid advance of Mexican, while its usual leader, Ophir, didn't make a rise at all in proportion. On Wednesday the open board session began with a quick upward movement, which was immediately followed by a flood of stock being dumped into the market, which, being in a sensitive state, caused by the decline of Tuesday, was unable to stand the pressure. Numerous persons who had bought for a turn on Tuesday, thinking the bottom had been touched, became nervous and dropped their stock upon the impulse of the moment.

Although the time for transacting business in the Board was extended this week, the brokers couldn't get through half the list. On Tuesday the time for transactions was again extended to one hour and a half, and the number of stocks called was still less than those of Monday, consisting only of the first 18 on the list. The business done in each stock was very large, and though prices averaged lower than those brought at the informal session, it goes to prove there were an unusual number of orders in the hands of brokers. The cause of the extreme rise of Monday is said to have been the large number of orders accumulated during Friday, Saturday and Sunday. The telegraph wires beginning to work on Saturday after the regular business hours were over, transactions of only a limited nature could then be filed and were necessarily laid over until Monday, when all coming in together upon an extremely sensitive market brought about the result which followed.

This has been a most eventful week for mining stocks. The market has been "booming," although as we write (Thursday evening) there are signs of a relapse back nearly to former prices. This has been the longest continued rising market for a very long time. Tuesday was the most exciting day witnessed in the stock market since the great excitement of December and January, 1874-75, while the advances and declines in many of the stocks would compare favorably to the rapid fluctuations of those days. A good many think that the large market promised is close at hand, and that the uncovering of new ore deposits, and the large yield of the Con. Virginia, and the promises that California is to start in crushing and begin the earning of dividends within 30 days, indicate that such is the disposition of those who control the market, notwithstanding the rumors that Flood & O'Brien are striving to keep the market down so as to get control of those mines that are threatening to expose developments that may rival the bonanza of the California and Con. Virginia.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior in proximity to the mines mentioned.

California.

ALAMEDA.

NEW COAL DISCOVERY.—*Livermore Enterprise*, March 4: Mr. Jenkins Richards some time since started a tunnel about half a mile above the Livermore coal mine in hopes of striking a new vein, and after running 400 feet struck a vein of coal six feet in width, and ran upwards of 45 feet from the surface. The sample sent us shows a clear bituminous coal, and the approach in splendid condition. Mr. Richards expects to have a sample supply of coal before the public within the next two weeks. We anticipate a very prosperous discovery, and we shall take pains to visit and inspect the mine before speaking further.

ALPINE.

EXCHQUER.—*Alpine Chronicle*, Feb. 26: Sinking of another 100 feet in the 300-ft shaft will commence next week. Good ore is to be mined to the mill. The mill is being put in order as fast as possible, and will commence crushing within the next three weeks. Foreman Beach has orders to increase the force as he can make available.

SIGNIFICANT.—Thirteen of the men working at the Exchequer mine applied to Manager Chalmers, last week, for Exchequer stock. The manager has written to the board of directors that the stock is for sale. That the practical miners in the employ of this company desire to invest their hard earnings in its mine, is a good evidence of its riches.

AMADOR.

CONTRACT LET.—*Amador Ledger*, March 4: We mentioned in our issue of two weeks ago that a quartz ledge had been uncovered on the hill overlooking Sutter creek, facing the Amador Consolidated mine, on the opposite side of the road. We have now to state that a week ago a contract was let to sink 100 feet on this property. The opinion is held by many mining experts that the main ledge extends in this direction, and from its proximity to the Amador Consolidated, it is confidently believed that if a mine is developed in this locality it will be a rich one.

ONIDA MINE.—Taking advantage of the scarcity of fuel and the consequent temporary stoppage of the mill, prospecting operations are being pushed forward on this mine. A new level is being opened at a depth of 140 feet. The east crosscut in this level has already entered the black slate which is always found adjoining the ledge. It will strike the ore body this week on the north end, which has always been found the richest part of the lead. The 1000-ft level is being pushed south into the hill separating the Onida from the Kennedy—a locality which has never been explored. Altogether, the mine is being prepared for vigorous work through the coming summer.

STRUCK IT RICH.—Recently, Richard Stoken, while prospecting near the Pioneer claim, about four miles above Volcano, struck a small quartz vein, some six or eight inches wide. Some of the specimens were exceedingly rich in free gold, and he was induced to crush a few pounds of the rock in a mortar, realizing that he had struck it rich. He then commenced washing the dirt after the water. After working for a few days with a pan, he took out \$200 in coarse gold. He has evidently happened upon one of those rich pockets, which seem to abound in that part of the country.

ANOTHER FIND.—John Brown and George Troop lately discovered a quartz lead some four miles beyond Volcano. The vein ranges from eight to 18 inches in width, and is about 100 feet long. The ore is very rich, and the owners have put a tunnel to the hill, and are now sinking a shaft to connect with the tunnel. The mining interest in that particular section has picked up considerably of late.

BUTTE.

GOLD.—*Oroville Mercury*, March 3: On Saturday last week the Spring Valley mine, near Cherokee, sent to San Francisco three bars of gold that were worth \$61,400. A few days previous the same company sent about \$12,000 worth of gold, making in the week \$73,000, all of which was the result of less than 30 days' run. This is not the full amount of the run, as the company is still engaged in closing up, but is what has been taken from the boxes that had been cleaned on Thursday of last week. With such good luck, it is hard to be convinced that the mines are "played out," as Mr. Berry and some of his conspirators would have us believe.

KERN.

RICH DEVELOPMENTS.—*Southern Californian*, March 4: The Consolidated Bunnell company have opened a new tunnel on their lead on their claim on the mountain, one mile southwest from the Bunnell tunnel, which promises rich developments. The lead is 22 feet in width, and assays as well, if not better, than that in the original at Bunnell. John A. Harley, of San Francisco, principal owner in the mine, has forwarded the machinery for the mill, and expects to have it in running order in ninety days. There are now 40 men at work on the mine and mill. We had the pleasure of meeting Mr. Harley last week, and he indicates abundant spirit for the enterprise. There will be no lack of water to effect the process, the rich deposits already visible from the surface. John A. Harley, the proprietor of the Winnemucca reduction works of Nevada, has the superintendence of the construction of the mill and furnaces. The mine has been examined by experts sent from San Francisco, and some of the most celebrated mine owners of Nevada are arranging for interests in the new discovery. Mr. Harley proceeded to San Francisco and secured the necessary money for the expedition, and nothing will be spared to advance the enterprise, the great value of which is assured by more recent assays of the ore and reports of mining experts who have completed their examination.

NEVADA.

MOORE'S FLAT.—*Cor. Nevada Transcript*, March 5: Once again we are enjoying the blessings of a blockaded road and a scarcity of provisions. Our road is blocked for five miles with a depth of from four to six feet of snow, and at present writing the snow is coming down with a vengeance. The Harley shaft has again been substituted for the mail bag, and the stage comes in on snow shoes. The stage companies, who have been running a little water to keep their mines from slush. Outside of this, nothing is being done in the way of mining. Notwithstanding the severity of the winter, our miners have bright prospects ahead, and the amount of sickness that will be sent down the Yuba from here next summer will make the Grangers swear. We have no coal, salt meat, or greens of any kind in our market, and a snow shoe train is sent twice a week for supplies to Bloomfield. This is the first winter our merchants have been caught out, but they won't be caught napping next fall.

OR. HILL.—*Foothill Tidings*, March 4: The last 20 days' run of this mine and mill gave over 600 ounces of gold from the plates and enough sulphurets to make the yield worth something over \$11,000; and the host of it

is, the pay chute improves as they go southerly. No wonder Omaha stock took an upward about lately and that other mines in the vicinity are held and esteemed "glit edges," particularly those on the same side south.

NEW YORK HILL.—We hear very few raba rumors from this mine, one of which is that they have three pay chutes now and are taking out good mill rock from all.

PLACER.

Mining Materials.—*Placer Herald*, Mar. 4: Recent developments have given great impetus to the mining interests in this part of the county, and in Ophir district especially. The Orator, which belongs to the St. Patrick company, is yet, and likely for some time to remain, the banner mine of this district, and perhaps without a superior in the State. This mine is under the superintendence of John A. Townsend, a miner of about 30 years' practical experience, who doubtless knows as much about quartz mining as any other man in California. The rock from the Orator has been yielding well for some time, as may be better realized when it is known that with all the extensive improvements recently made, the company is entirely out of debt, and has ample means in the treasury for all immediate purposes. Mr. Townsend was to make his monthly report last Thursday, and the indications were that it would be a very good one, though at this writing we have not the returns.

The Kirkland mining company, comprised of Scotch capitalists, is just entering on an extensive quartz mining enterprise. All their works are under the supervision of F. R. J. Dixon, an old and experienced quartz miner. On the Kirkland claim they have recently erected new hoisting works. The shaft, which is 410 in the clear, and is as well timbered as any we ever saw, is now down about 70 feet. It is the intention of the company to sink the shaft on this mine 600 feet deep without stopping. As far as they have gone the rock prospects well, and the general opinion is that when they get to the 600 ft level, or even before, they will find themselves in possession of a fine paying mine.

The Good Friday, which has for some time past been yielding rich ore, has recently been purchased by the Kirkland company for \$15,000, and will be worked by that company hereafter for all its worth. The St. Lawrence mill, 13 stamps, has been leased by this company, with the right to purchase, perhaps, yet, and the work on the Kirkland claim they have recently erected new hoisting works. The shaft, which is 410 in the clear, and is as well timbered as any we ever saw, is now down about 70 feet. It is the intention of the company to sink the shaft on this mine 600 feet deep without stopping. As far as they have gone the rock prospects well, and the general opinion is that when they get to the 600 ft level, or even before, they will find themselves in possession of a fine paying mine.

The Julian, in Newcastle district, though we did not visit it, we learn is running steadily on paying ore.

Dutch Flat.—*Dutch Flat Forum*, March 2: Twelve miles above Dutch Flat are located several paying and prosperous mines, known as drift diggings. The first claim is known as the Dry Creek claim, owned by E. W. & B. H. Bartlett. In this mine they have a bedrock tunnel 110 feet long, where they strike the bedrock gravel, and from this point they are in 150 feet and are now working nearly 100 feet on the east side, and about 45 feet from the surface, on cases which are run by water power. Two men picked up in one day \$14 in chunks, and in the week over \$90. The prospects in this claim are flattering and promise good results. About 700 feet down the river from the above named claim is one owned by John Whipple & Co. No dirt as yet has been taken out by this company. They are running a bedrock tunnel 100 feet long, and are now working about 45 feet from the surface, on cases which are run by water power. Two men picked up in one day \$14 in chunks, and in the week over \$90. 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MISCELLANEOUS.

Scientific and Practical Ballooning.

Ballooning owes its origin to the discovery, about 1780, of hydrogen gas, by Cavendish, in England, and its extraordinary lightness. The first experiments to prove its levity were made by inclosing small quantities of the gas in airtight bags and allowing them to ascend into the upper regions of the atmosphere. Weights were attached to these bags to show the lifting power of the gas. Cavallo, the electrician, subsequently experimented in the same way in 1782. In 1783 the Montgolfier brothers, of Paris, repeated these experiments on a larger scale, and gave the first impulse to ballooning proper. They attached a car to a balloon, in which small animals were placed.

The first human being to ascend was M. Pelatre, who ventured up to a height of about 100 feet, with a rope attached to the car, by which it was drawn back. The same gentleman, accompanied with a friend, soon afterwards made an ascension to a height of 3,000 feet, descending at a point about five miles distant. From this time the art of ballooning made rapid progress.

It was at once made subservient to purposes of meteorology and physics, and as early as 1794, during the French revolution, was employed by the French as a military machine for making reconnoissances. The officers seat up communicated their observations to the earth by signaling with flags. The French army in Algiers, in 1830, were also provided with balloons. But the most important and really practical use to which that machine has been put was its war uses during the siege of Paris, when that city depended almost entirely upon her balloons and the carrier pigeons which they took away for intercourse with the outer world.

During that memorable siege 65 balloons were sent up from the beleaguered city, carrying in all 91 passengers, 363 pigeons and two and a half million letters. Only five of all this number fell into the hands of the German army, two descended on German territory and were captured, while one disappeared entirely. The fragments of another were found hanging on a tree at Port Natal, in south-eastern Africa, having traversed almost lengthwise across that continent. Where it dropped its unfortunate occupants was never known. All the others, 56 in number, descended safely beyond the radius of the besieging army in France, or upon neutral territory beyond.

The two great physicists, Biot and Gay-Lussac, made two ascents in 1804, to decide some important meteorological questions. They brought back from a height of about 20,000 feet a sample of the air, which was carefully examined and found to be identical in character with that at the surface, a matter, at the time, of considerable importance, as the uniformity of the atmosphere in the upper regions had been called in question.

In 1863, Nader attempted to take photographic maps while floating in the air, but failed.

The great problem of steering balloons has been studied and experimented upon by many of the ablest scientists and mechanists in France and the world, but hitherto with no very satisfactory success. Dupuy, commissioned by the Paris Academy of Sciences in 1872, has probably met with a larger measure of success than any one else, and has probably very nearly reached the ultimate in that direction. He gave his balloon a fish shape, and fitted it with an internal, or secondary balloon, containing more or less air and equal in bulk to one-tenth of the main balloon. The air could be let out of the inner balloon by valves, and drawn in again by an apparatus placed in the car. This arrangement was employed to supersede the use of ballast. He used a propelling screw turned by man-power, instead of steam, which latter was ignored, the strength of eight men being employed instead. His balloon carried in all 14 persons, and traveled about 60 miles. He carried an apparatus by which he was enabled to measure his speed, and also that of the wind. His balloon moved at the rate of about 540 feet per minute, while the wind was moving at the rate of about 2,900. The course of the balloon was at an angle of 12 degrees to the direction of the wind.

In this experiment the problem of steering was solved, although only to a slight degree—sufficient for only a very moderate movement of the air, but quite insufficient for anything like even a moderate breeze. This experiment is quite sufficient to show the inability of any attempt to make ballooning practical for any other purposes than those of war, where the expenses of carrying a messenger to or from a beleaguered city or army are never taken into account.

How They Do It Here.—A Frenchman who has lived in the United States for some years, says: "When they build a railroad in America, the first thing they do is to break ground. This done with great ceremony. Then they break the stockholders. That is done without ceremony."

GERMANY is going to send over here several officers of the mining department, with instructions to study up our mining industries.

Hidden Dangers.

The people of Vienna were thrown into quite a state of excitement soon after the terrible Bremerhaven affair, because a police agent, moved by that terrible catastrophe, had seized and thrown into the Danube three boxes of dynamite which were found in an exposed locality. These boxes, although plainly marked "Dynamite," had been lying in a public building about two years, without any thought of the dangerous character of their contents, until the officials were aroused by the announcement of the above-mentioned catastrophe, when they were hurriedly placed in the hands of a police agent, with the advice that they be at once thrown into the river. This sage advice was quickly carried out; but as attention was drawn to the matter by certain lookers-on, it was suggested that the disposition made of the dangerous compound was not altogether a judicious one, since it placed in jeopardy every sailing craft on the river, as well as the entire city adjacent thereto. Another officer acting on this second thought promptly fished out two of the boxes, but the third eluded his search, and hence the scare lest the missing box should suddenly reveal itself by the destruction of some bridge pier or passing boat.

The above reminds us of a similar instance which came, by hearsay, to the notice of the writer, in connection with a party in this city. The story as told to us is as follows:

At the time of the nitro-glycerine explosion in the rear of the office of Wells, Fargo & Co., on Montgomery street, the party in question had in his possession a small can of that dangerous compound, and, occupying a large lot in the process of being gradually filled up to the grade, thought to rid himself of it by hurrying it in the ground. The matter soon passed out of his mind, but was not long afterwards again called up by reason of some discussion in the city papers growing out of another similar accident. The party in question then commenced a careful search for the place of burial, with the view of its proper destruction, but failed to find the object of his search, and ever since has been very much in the same fix as the distressed citizens of the Austrian capital. Digging foundations for "permanent improvements" on that lot will be a somewhat dangerous operation.

Celluloid.

Celluloid is the name given to a recently devised compound resembling ivory, and which is now used for making of billiard balls, hair brushes, for the manufacture of teeth, and in general, for almost any use to which ivory may be put. This compound is said to be composed of gun-cotton, camphor and other ingredients of uncertain character. It is very innocent and attractive to the eye, but is made up of materials some of which at least we have learned to handle with much caution. The public have been led to believe, however, that when prepared for toilet and other use it is altogether free from danger. Perhaps it is so—so far as actual end violent explosion is concerned; nevertheless, it is asserted that celluloid will readily take fire, and burn with much violence, giving off large amounts of noxious gases, much like the burning of loose dynamite. If this is so, gentlemen who wear celluloid teeth should beware how they put the lighted end of a cigar in their mouths; and ladies who use hair brushes with celluloid handles, should see that they do not bring them too close to the gas-light, for fear of unpleasant consequences. In this age of discovery and invention and adulteration, it is difficult to tell what manner of thing we are either using, eating or drinking.

ARE THEY TO HAVE A TRUE REPUBLIC IN FRANCE?—The result of the recent elections in that country appear to look that way. All the factions there seem to have been defeated. The Republicans appear to be the only power there worthy the name of "party." The Bonapartists, the Legitimists, the Radicals, the Constitutionists and the Conservatives have been ruthlessly slaughtered—have all been pushed to the wall by the Republican masses. Will the leaders of the party, now coming into power, venture to plant themselves upon true republican principles? Are the people of France ready for such a stand? Do the Republican leaders dare to trust the people with a free ballot and a free press? If such a policy can be made successful, a glorious future is open for the French people—a future, the attainment of which will be well worth all the suffering, humiliation and cost of their late terrible conflict with Germany.

EATING QUAILS.—It has often been said and printed that no person could eat a quail, each day, for 30 consecutive days—that, owing to some peculiarity about the flesh of that bird, the attempt at such a gastronomic operation would often lead to such a nauseous loathing as would utterly forbid the entrance to the stomach of even the twentieth bird. But now come a brace of Frenchmen from Louisville, Ky., who put to naught this saying by readily accomplishing the feat; while one of the twain, after swallowing the thirtieth bird, smacked his lips and called for No. 31, which, with four others, was quickly dispatched, when nature rebelled against any further gormandizing.

Business Outlook.

A general stagnation of trade appears to be the case just now in nearly every part of the world. It seems as though all the nations had adopted a policy of a masterly inactivity, or if anything is attempted it is almost always in the way of "selling off." English manufacturers and iron masters are alarmed at the prospect of an almost total annihilation of their American trade. The monetary disturbances in Germany are closing up or running short all her large establishments. There is a moderate degree of activity manifested in France, which, the result of the recent elections will no doubt serve to increase. In our own country financial difficulties and uncertainties seem to hang like a pall over the people, depressing every department of business, without any prospect of immediate relief.

In California almost an equal depression prevails, notwithstanding the universal belief that we are just on the eve of one of the most prosperous business seasons which we have ever met with. But here we are not without hope; all believe in an early and favorable change. The excessive and almost continuous fall of rain which has characterized the present winter has rendered the roads of the interior almost impassable—but little can be done in the way of transportation away from the lines of railroad; merchants in the interior are letting their stocks run to the lowest possible point, while waiting for the roads to become passable again. The farmers, too, are very much behind hand in plowing and seeding, for the same reason. In the meantime the season is advancing and we shall soon reach the time when the rains must cease and the winds and the sun put the roads and fields in order for wheels and plows. When that time does come, San Francisco and California will see one of the brightest seasons ever witnessed here. There will be a large demand for labor; the interior merchants will fill up their depleted stores; the mines, favored with an abundance of water, will pour out their wealth; money will flow back and forth in its accustomed channels, and California will be blessed beyond measure in this our nation's Centennial year.

THE NEWSPAPER BUSINESS.—Perhaps no department of industry has felt the depression which has borne so hard upon the country during the last two years, more seriously than the newspaper business. A carefully kept record shows that during the 12 months preceding November last, over 1,000 newspapers had ceased publication in the United States. It is probable, however, that very few of those papers occupied any field of newspaper literature, where such publications were specially needed; or if they did, the presumption is that there was a lack of either energy or talent equal to the position. A newspaper, properly placed and conducted, is a necessity, not a luxury, and consequently is not dispensed with when hard times overtake the reader. If a paper is really needed in any community, the people will sustain it in spite of hard times, provided the publishers are able to fill the bill.

THE BRITISH COAL INDUSTRY.—The estimate of the amount of coal raised in Great Britain is 130,000,000 tons; of this amount less than 5,000,000 is exported. The loss of life by explosions and other mine accidents is about 1,050 per year, or one death for 106,000 tons of coal raised. These death statistics are collected and preserved, year after year, with much care and dreadful regularity, so that a collier's life may be pretty accurately calculated, according to the amount of coal raised.

BROOMS.—The last outgoing Australian steamer took away a large quantity of brooms—1,134 dozen to Australia and 303 dozen to New Zealand. The broom industry of San Francisco is fast rising to considerable importance, and the manufacturers are building up quite a lucrative business both at home and abroad. It furnishes a large amount of employment on the farm and in the workshop as well.

MAMMOTH BUNCHES OF GRAPES.—Two bunches of grapes were exhibited at the fruit show in Edinburgh, Scotland, last fall, which weighed, respectively, 25 and 26½ pounds. The English papers pronounce them the largest ever produced anywhere. Can our California grape growers go one better than this? If so, we would like to publish the fact for the benefit of our English cousins and the rest of mankind.

THERE are 1,066 manufactories of iron, gold, silver, brass, tinware, lumber, leather, fabrics, dry goods, liquors, groceries, animal products, etc., in San Francisco, that pay \$27,012,881 for raw material, have \$31,333,781 invested capital, employ 9,713 white men, 2,697 women and 1,485 children, and 10,813 Chinese.

THE Indians continue to be very troublesome in the Big Horn country, Montana. Fighting between the Indians and the soldiers of Fort Pease was going on continually during January; any person who left the post was sure to be shot at, making it a difficult matter to procure provisions.

THE Keeley motor has once more been heard from—by the way of an explosion at Keeley's shop in Philadelphia.

The Mahogany G. & S. M. Co.

Some weeks ago the following proposition, signed by a large number of the creditors of the Mahogany gold and silver mining company in this camp, was forwarded for the consideration of the company in San Francisco:

SILVER CITY, I. T., Jan. 27th, 1876.
To the President and Trustees of the Mahogany gold and silver mining company, San Francisco:

The undersigned miners who have heretofore been employed by said company and left unpaid, and the merchants and business men of Owyhee county who have furnished to said company goods, provisions and material to work said mine, and are also unpaid, hereby respectfully represent that we are all great sufferers on account of the general failure of the San Francisco mining corporations to pay their obligations, and the miners particularly are actually without the means to satisfy hunger; and

WHEREAS, The Mahogany mine belonging to you is known to be sufficiently rich in gold and silver to pay all the debts of said company when honestly worked and the proceeds faithfully accounted for; and, after patiently waiting several months, we fail to discover any effort upon your part to either work the mine or pay your debts, we have

Resolved, To apply to you for permission to work said Mahogany mine upon our own account, and, after paying the necessary current expenses, to apply the surplus to the payment of the respective amounts due us; and we urgently request that you empower some person to act for you in granting to us a lease or contract embodying the principles and provisions above indicated. This is not an agreeable request for us to make of the leading corporation engaged in Owyhee, but we are driven to this alternative or the equally unpleasant ones of starvation or hunting up George M. Pinney, in Peru.

Very respectfully, yours, etc.
No response in relation to the above, says the Owyhee *Avalanche*, has been received. The Mahogany creditors, however, are invited to accept 25 cents on the dollar or take stock of the corporation in full for the amount of their claims. A proposition to that effect has been sent here by the company, having been forwarded through C. W. Moore, Esq., who arrived from San Francisco last Wednesday. The matter is to be discussed by the creditors at a meeting to be held to-morrow afternoon. The proposition to accept 25 cents on the dollar will probably meet with strong opposition, it being conceded that the offer is not sufficiently liberal to meet with favor. The parties living here, interested in these claims, are accustomed to paying their debts on the basis of 100 cents on the dollar, and, if they accept 25 cents on these and other claims, they would soon be minus the requisite means to keep up the good reputation they have hitherto enjoyed. The proposal to issue stock to the creditors in liquidation to their claims will undoubtedly be regarded with more favor than the other, although it is by no means certain of being accepted. In this matter of taking stock several things are to be considered and, among others, the question as to how many shares of stock there are in the hands of the company which they are at liberty to divide *pro rata* among the creditors. This question must be answered before a price can be set upon the stock. We understand that there is the sum of \$5,000 in the treasury of the company in San Francisco, and at the lowest estimate there is at least \$10,000 worth of ore out at the mine ready for crushing. Estimating that the hauling and milling of this ore will cost \$5,000 (it probably wouldn't cost that much) the company have an equivalent to \$10,000 cash on hand. The mine is well opened and in better condition for yielding ore than ever it was; the ledge also shows up larger and richer than at any period since it has been worked. So, taking the promising condition of the mine into consideration, it seems decidedly too bad and unjust that the Mahogany company should resort to the questionable course of endeavoring to pay its honestly contracted debts at 25 cents on the dollar.

DR. PETERMAN, the great German geographer, expresses himself satisfied that the diamond fields at Zimabwe, Africa, are identical with the Ophir of the Bible, from which King Solomon is said to have conveyed gold and ivory and precious stones for the construction of the temple. The place possesses ruins and extensive piles of buildings of unquestionably remote antiquity.

The new machinery for the joint shaft of the Amazon and Glasgow has arrived on the ground, and the grading for its reception will be finished in a day or two more, when the machinery will be immediately placed in a position for work.

The cinnabar company on Applegate, Jackson county, Oregon, are now burning a large quantity of brick to use for their furnaces preparatory to commencing operations on an extensive scale the coming summer.

AIR pipes are being put in to conduct air from the Belcher air shaft down to the 1700-foot level, and when completed will greatly aid the prosecution of work in that portion of the Crown Point mine.

A GREAT excitement has been created at Socorro County, New Mexico, by the discovery of immense deposits of copper ore.

ELEVEN men and twenty five girls are employed by the Angora robe and glove company at San Jose.

USEFUL INFORMATION.

Chewing Gum.

Under the incorrect name of hemlock or spruce gum, considerable quantities of an exudation from the hemlock or hemlock spruce are annually sold. We say incorrect name, as the article is in no sense a gum, but is properly a turpentine, consisting of a resin and a small proportion of volatile oil. It is similar in its nature to the white turpentine which exudes from the Southern pine, but having less oil, is much harder. It is also called Canada pitch. The hemlock while growing contains very little resinous juice, and the lumber is very free from it, but when the tree from any cause begins to decay, the turpentine or "gum" appears upon the surface in nodules, some of which are the size of a walnut or smaller, while others are as large as a hen's egg. It is a very common thing among young persons who live where the hemlock abounds, to get into the habit of gum chewing; the orientals use mastic for strengthening the gums and perfuming the breath, and it is possible the use of chewing gum originated in some such notion. The chewing gum of a few years ago was this turpentine of the hemlock, or spruce gum, refined, but this has latterly been superseded by paraffine, which is a white wax-like product of petroleum or coal-oil.

The resinous product yielded by the Norway spruce in its native forests is known in this country as the Burgundy pitch, and is much used for making a stimulating plaster; the hemlock pitch is also used for the same purpose, and very closely resembles the imported article in its effects. In one way and another the article finds a sale at prices which make it worth while for those who live near hemlock forests to collect the "gum," as it is always called by the country people. Early in the fall or late in the summer, after the haying is over, some of the farmers go a "gumming," as it is styled; they go to the woods, where they erect a log shanty, and proceed to collect the gum for the market. A long pole is provided, below the tip of which is fastened a circular box or receptacle, generally the leg of a boot, kept in shape by a circular piece of wood, through which the end of the pole projects; on the end of the pole is fastened a chisel. Having a satchel sling over his shoulder, the collector proceeds in search of gum-bearing trees, and when found, uses the implement. The gum detached by the chisel falls into the box beneath, and from this it is transferred from time to time, to the satchel or haversack. These receptacles are emptied into a large bag, and when this is full it is taken to the log hut. During rainy days, evenings and at odd times, the gum is freed from twigs, bits of bark and other impurities, and made ready for market. The collecting of gum is sometimes very profitable; in some cases over \$2,000 have been realized by two men in a single season, but such returns are exceptional. The season lasts until the weather becomes too cold to work in, when the camp is broken up.

DECOMPOSITION—GUARD AGAINST ITS EFFECTS.—Refuse and waste are the natural enemies to the health of mankind. The products of their decomposition pervade every household. Their offensive odors are charitable warnings to guard against. From the cellar, store-room, pantry, bed-room, sitting-room and parlor; from decaying vegetables, fruits, meats, soiled clothing, old garments, old furniture, refuse of kitchen, moldy walls, everywhere, a microscopic germ is propagating. It contains in itself the seeds of disease—all that is needed is the proper soil or condition of constitution adapted for its reception. Each germ may find its specific habitat, and hence develop into some specific malady. Typhoid, typhus, cerebro-spinal, relapsing or scarlet fever, measles, small-pox, roseola, cholera or some other form of disease may result. Cleanliness, pure air, sunlight and pure water are the antidotes. God indicates and provides these in abundance. He who neglects or rejects these deserves to suffer, as he surely will.

A CURIOUS PHENOMENON, frequently met with in the Indian ocean, the real cause of which has not yet been ascertained, is the existence off Malabar, and in certain spots along the Coromandel coast, of vast mud-banks, and of tracks of mud suspended in the sea, wherein many kinds of fish find abundance of food, immunity from much disturbance in the surrounding element, and a locality in which to breed. The exact cause of the existence of these large tracts of sea wherein mud remains in solution is still a mystery; but at any rate the ocean is so smooth that, even during the height of the southwest monsoon, vessels can run for shelter into their midst, and once there are as safe as when inside a breakwater.

TO DRILL INTO HARD STEEL.—Make your drill oval in form, instead of the usual pointed shape, and temper as hard as it will bear without breaking; then roughen the surface where you desire to drill with a little diluted muriatic acid, and, instead of oil, use turpentine or kerosene, in which a little gum camphor has been dissolved, with your drill. In operating, keep the pressure on your drill firm and steady; and if the bottom of the hole should chance to become burnished, so that the drill will not act, as sometimes happens, again roughen with diluted acid as before; then clean out the hole carefully, and proceed again.

THE MAN WHO NEVER TASTED FLESH.—There is said to be a new living, one-half mile south of Holmesdale, Penn., an old farmer by the name of Abraham Blatt, who is about 60 years of age, is healthy, robust, and as strong as a horse, who has never in his lifetime tasted the least bit of meat of any kind. He says he never tasted beef, pork, mutton or veal, eats no kind of poultry, no kind of fish, no kind of game, in fact nothing pertaining to meat. He has such an abhorrence of meat that when they kill a cow or hog on his premises, he generally leaves home and goes about other business. He is the father of a large family, all healthy children. Among them is also one boy, who, like his father, eats no meat of any kind. In reply to the questions put to the father how he could work so hard without eating any meat, he says he believes he is much healthier than if he ate meat. He uses very little butter.

TO CLEAN LOOKING-GLASSES.—Wash thoroughly a piece of soft sponge, and remove all gritty particles from it, dip it slightly into water, squeeze it out again, and then dip it in some spirits of wine; rub it over the glass, dust it with some powdered blue or whiting sifted through muslin; remove it lightly and quickly with a clean cloth, and finish with a silk handkerchief. If the glass be a large one, clean one-half at a time, otherwise the spirits of wine will dry before it can be removed. If the frames are gilt, the greatest care must be taken to prevent the spirits of wine from touching them. To clean such frames, rub them well with a little dry cotton wool; this will remove all dust and dirt without injury to the gilding. If the frames are varnished, they may be rubbed with the spirits of wine, which will take out all the spots and give the varnish a superior polish.

CEMENT FOR MARBLE AND ALABASTER.—Mix 12 parts of Portland cement, 6 parts of slacked lime, 6 parts of fine sand, and 1 part of infusorial earth, and make no into a thick paste with salicate of soda. The object to be cemented does not require to be heated. It sets in 24 hours, and the fracture cannot readily be found.

LOOSE SCREWS.—It is a common thing when a screw or staple becomes loose to draw it out, plug up with wood and re-insert. But screws and staples so secured soon come out again. It has been found that a much better way is to fill up the holes tightly with cork. Screws and irons so secured will remain perfectly tight as long as when put into new wood.

GOOD HEALTH.

Medicated ice.

The possibility of using antiseptics in medicine was recently pointed out by Edward Martin, in a letter to the *Lancet*, from which the following is taken:

"Every practitioner has at times to face the difficulties of the scarlatinal throat in young children. It may sadly want topical medication; but how is he to apply it? Young children cannot gargle, and to attempt the brush or spray often fills them with terror. In many cases neither sterility nor coaxing avails. Yet these little ones in almost every case greedily suck bits of ice. This has long been my chief resource where I could not persuade the child to submit to the sulphurous acid spray. Lately I have been trying an ice formed of a frozen solution of the acid (or some other antiseptic). Though, of course, not so tasteless as pure ice, the flavor is so much lessened by the low temperature, and probably also through the parched tongue very little appreciating any flavor whatever, that I find scarcely any complaint on that score from the little sufferers; they generally take to it very readily. The process of making it is very simple. A large test tube immersed in a mixture of pounded ice and salt is the only apparatus required, and in this the solution is easily frozen. When quite solid, a momontary dip of the tube in hot water enables one to turn out the cylinder of ice as the cook turns out her mold of jelly. I have tried the three following formulae, all of which answer, though I think I prefer the first: 1st. Sulphurous acid, one-half drachm; water, seven and a half drachms: mix and freeze. 2d. Chlorate of potash, one scruple; water, one ounce: dissolve and freeze. 3d. Solution of chlorinated soda, one-half drachm; water, one ounce: mix and freeze.

"However, the form is of secondary importance, as each practitioner can construct his own. Boracic acid, salicylic acid, or any other harmless antiseptic with not too much taste, would, doubtless, be as useful as those indicated."

DRY EARTH treatment for ulcers has been found very successful. Large, sloughy ulcers, after being washed, were covered with a thick layer of earth, over which wet paper was placed as a support, the whole being neatly bandaged. In a few days the ulcers began to clear, and when the surfaces looked healthy and granulating, a dressing made as follows was used: A piece of muslin the size of the ulcer was immersed in carbolic oil (in the proportion of one part acid to ten parts cocoon oil); with this the sore was covered, and over that dry earth was placed, and then moistened earth and a bandage. In a short time the healing process manifested itself satisfactorily, while all odor was entirely removed.

Rheumatic Recipes.

The *Journal of Health* has patiently collected and published 100 recipes for the cure of rheumatism, and spreads them before its readers in the following manner:

Rochelle salts. Gualiacum. Rub with chloroform liniment. Sleep with your head toward the north. Nux vomica. Wear a chest protector. Nitrate of potash. Nitrate of sodium. Fowler's solution of arsenic. Sleep with a big dog and give it to him. Kill a big dog and, after taking out his intestines, put your feet where they came from. Magnetism. Galvanism. Bromide of ammonium. Iodide of ammonium. Mustard plasters. Spanish fly plasters. Bromide of potassium. Iodide of potassium. Lemon juice. Sage tea. Wear sulphur in your shoes. Hard rubbing. Oleate of mercury. Common soda. Capsicum. "Ridway's Ready Relief." Wear silk. Wear flannel. Wear buckskin. Gird and hemlock. Reynolds' specific. Make a necklace of the knots produced by the sting of an insect on "Golden Rod," and wear it next the skin. Citrate of lithia. Exercise and keep it off. Keep as quiet as possible. Colehiem. Morphine. Water cure. Angel's rheumatic gum. Pray fervently. Soft soap, bandaged with flannel. Do not eat meat. Do not eat eggs or potatoes. Eat anything you please. Opium. Do not smoke at all. Smoke all you like. Take camphor. Drink nothing but beer. Do not drink anything but whisky. Do not drink anything at all. Do not leave the house. Take a ride out whenever you can. Carry a piece of alum in your pocket. Take Turkish baths. The Turkish bath is one of the worst things for rheumatism. De Soto spring water. Acetate of potash. Burdock seed. Bathe in hot water with perlash in it. Bathe in cold water frequently. Do not bathe at all until you are nearly well. Cut up tea. Wrap fresh lamb's entrails around your neck. Drink brandy. Brandy is very bad for rheumatism. Sleep next to flannel. Go to Arkansas hot springs. Go to Doolittle springs—to Saratoga, to Florida, to Bermuda, to the Sandwich islands, to California, to the south of France, to Mexico, to the Azores, to South America. Wear a horse chestnut in your left hand breeches pocket. Wear a potato in the other. Take "Constitution water." Take carbolic acid. Wrap joints with cotton, and cover with oiled silk. Glen Flora water. Get out on the prairies. High land is best for rheumatism. Balm of life. Magnetic aloe. Rub with kerosene. Mustang liniment. Read Job. Put on hot poultices. Apply hop mashes. Do not swear. Put mustard plasters over the heart. Drink Friedrichs' bitter water. Sciditiz powders. Take a quart of alcohol with a dozen lemons in it. Take spirits of turpentine. Rub with spirits of turpentine. Slippery elm poultice. Electric oil.

Any disease that won't succumb to one or all of the above remedies must be hard to cure.

DISEASE AND ITS CAUSE.—On inquiring recently about the health of a lady to whom I had just been introduced, she said her health was not good; that she was subject to frequent attacks of chills and fever. I asked her if she lived near a swamp or a stream of water. "Why, I live," said she, "on the bank of a large millpond that is covered with green slime!" No. 2. A man and his wife were both taken sick the same night, the one of spinal meningitis and the other of diphtheria. Having occasion to enter the house a few days later, I was almost knocked down by a stench which I had never before encountered. It was fairly penetrating, like the ammonia that rises from fermenting stable manure. Strange to say, both of these persons have recovered. No. 3. In the same village is a slaughter house, to the rear of which is a pen containing some half a dozen filthy-looking hogs wallowing in filth three or four feet in depth, consisting of beef skulls, bones, entrails, blood and manure, and all this in less than two rods from the residence of the owner, whose wife and only daughter now lie sick of typhoid fever. Regarding the cause of these sicknesses, I do not think there should be much doubt, or that the sick persons deserve some punishment for their disregard of the laws of health.—*N. Y. Tribune.*

DEATH FROM THE STING OF A BEE.—On the 4th of last September a young girl living at the hamlet of Crevecoeur was stung by a bee on the left cheek and died a few minutes afterward. She had manifested symptoms of nervous disorder, supposed to be hysterical, previously. A year and a half before she had been stung by a bee and had remained insensible for more than four hours afterward.—*Les Mondes.*

SUFFOCATING INFANTS.—At an inquest held in London, the other day, on the body of an infant that had been suffocated in bed, the deputy coroner said the frequency of those cases was alarming. Upward of 300 children were suffocated in bed annually in the central district of Middlesex alone. Seven-tenths of these suffocations occurred on Sunday mornings.

CHOKED BY A TOWEL.—A very singular accident happened to a boy in Fulton county, Ill., a few days ago. While wiping himself with a ragged towel he inserted his head through a hole in the cloth, and while in this situation he was suddenly taken with a fit and fell, and the towel closing around his throat, he was strangled to death before he was discovered.

DOMESTIC ECONOMY.

House Mats.

Editors Press:—My "better half" has just notified me that I must inform the Press readers and "Sister Grangers," how to utilize old bay ropes by making them up into door mats, buggy mats, etc. Take a coarse potato sack, stretch it upon a frame a size larger than the sack; then take a coarse needle and twine, sewing the sack to the frame by a stitch which tailors would call "over and over." Prepare a needle for working in the rope from an old table fork, filing it into shape like a crochet needle, only stout enough in the cavity, or hook, to hold the rope, thus:



The work is performed the same as in making a rag mat. The rope is some half inch free on top, and cut with sharp scissors after being hooked in. This mat is not a fancy piece of work, but will be found serviceable and durable, costing nothing but labor, which becomes almost a recreation.

There are generally waste ropes in abundance around rural homesteads, which are considered useless except to tie up old barns and balter ropes, which would place a useful mat at every door of the house, and supply the buggy besides. This work may be performed on rainy days, or during long winter evenings, by old or young, man or maiden.

The plethoric wealthy need not look up for old broken tinied forks, or waste bay ropes. 'Tis only for the industrious poor, securing a necessary comfort for a clean house at small expense. How many days are spent in fine fancy work by dainty fingers, while muddied boots are making muddy floors, all of which might be avoided by a potato sack bay rope mat. JOHN TAYLOR.

Chinese Camp, Feb. 11th, 1876.

Nutritive Food.

In 1868 Liebig invented a new soup for children, now universally known as "Liebig's food for infants." Wheat flour or powdered malt is transformed into dextrose or dinstase, at the proper temperature, while milk and some potassium carbonate are added. The principle is to produce a food as much as possible similar in composition and action to woman's milk. This exquisite mode of preparing food for infants (which I have employed for years with the most perfect success) would be a much more suitable lesson for schools of cookery than the preparation of offal into the semblance of savor. The problem of feeding the young and the poor physiologically is not easy, but it is simple if considered from the scientific point of view. The bulk of the food of the lower classes must always be bread; it is perfectly idle to believe that this can be altered. Peas, beans, and other like leguminous plants, however rich in albumen, can never compete with bread; first, because they require steeping in water and boiling for hours; next, they become hard so easily, and then are indigestible, while at all times they are not so easy to be digested as bread. But bread is not so good a food as meat; here chemistry comes in, and, as Liebig says, shows that bread soaked in broth made from extract of meat is as good food as the best meat diet. In this, as a practical proposition, I fully agree.

A man who is physiologically fed, though without regard to much taste in the food, may be in the best possible physical condition and vigorous. He has the privilege of the animal, which is contented with and thrives upon things which have no prominent taste and require no spice. The fowl can taste nothing of the whole corn which it eats, yet how eagerly does it eat of it! It knows its nutritive value as a matter of inner consciousness. Thus, when our population will use more meat extract, and perhaps a little less tea and more of Liebig's food for their strength, health and vitality, and will find for themselves that the greatest good of life is health, and that no artifices of small cookery will be worth having, which are, as they must be, unable to maintain the body in vigor.—*Cantor Lecture.*

MINCEMEAT FRITTERS.—With half a pound mince meat mix two ounces fine bread crumbs, or a tablespoonful flour, two eggs well beaten and the strained juice of half a small lemon. Mix these well and drop the fritters with a dessert spoon into plenty of pure lard; fry from seven to eight minutes, drain them in a napkin and send them very hot to the table. They should be quite small.

PULLEN BREAD.—Pull the soft portion of a new loaf into pieces; let them be of equal size, say about two or three inches each way. Dry the pieces in a slow oven or before the fire till they become a nice light brown color, and when they are quite crisp they will be ready for use. They are very nice with coffee.

HOW TO MAKE THE TEA GO FURTHER.—A method has been discovered for making more than the usual quantity of tea from any given quantity of the leaf. The whole secret consists in steaming the leaf before steeping. By this process, it is said, 14 pints of good quality may be brewed from one ounce of tea.



W. B. EWER.....SENIOR EDITOR.

DEWEY & CO., Publishers.

A. T. DEWEY, GEO. H. STONG
W. B. EWER, JNO. L. BOONE

Office, No. 224 Sansome St., S. E. Corner
of California St., San Francisco.

Subscription and Advertising Rates:

Advertising Rates—1 week, 1 month, 3 months, 1 year.	Per line.	25	30	\$2.00	\$5.00
One-half inch.	\$1.00	3.00	7.50	24.00	
One inch.	1.50	4.00	12.00	40.00	

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We wish to thank those subscribers who send in their renewals to the Press promptly as regularly as the year comes round. It saves us much expense in commissions for collections and renewals. May we not request more of our good patrons to do so!

SAMPLE COPIES.—Occasionally we send copies of this paper to persons who we believe would be benefited by subscribing for it, or willing to assist us in extending its circulation. We call the attention of such to our prospectus and terms of subscription.

THE ORIGINAL ARTICLES in this paper are mostly set in solid type, giving in our columns one-third more reading than is contained in ordinary leaded matter.

Our latest forms go to press on Thursday evening.

San Francisco:

Saturday Morning, March 11, 1876

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NEW ADVERTISEMENTS.

Cameron's Steam Pump, Neylan & Young, S. F.; Hoadley Portable Steam Engines, Treadwell & Co., S. F.; Klamath Quartz Mining Co.—Assessment; Golden Sun Mining Co.—Assessment.

QUICK WORK.—The Consolidated Virginia mining company on Tuesday shipped 107 bars of bullion, weighing over six tons and valued at \$378,232.55. This is the largest single shipment ever made by any company on the Comstock lode. The Belcher company once made a shipment of \$335,000. The work of melting and assaying the large amount of bullion mentioned above was commenced on Monday morning and finished on Tuesday morning by 11 o'clock, there also being made during the time 140 ore assays. This is undoubtedly the biggest work ever done in the way of melting and assaying silver bullion.

THERE is great excitement in Utah over the discovery of rich mines south of Pioche, near the Arizona line. One of the discoverers arrived at Ogden with a few tons of the ore, which he sold for \$12,000, and stated that there was a great quantity of it, and he created such an excitement that several are preparing to leave Ogden for the scene of operations.

A MINING company in Spruce Mount hired all the labor and bought all they could on credit, and then sold out, failing to settle their bills.

Engineering Abroad.

Prof. George Davidson, of the United States Coast Survey, President of the California Academy of Sciences, returned this week from a tour of observation around the world, having been absent some 18 months. He left here as one of the observers of the transit of Venus for the United States Government, having in charge a party of observers in Japan. His travels extended to Japan, India, Egypt, and all through Europe, his principal object being the gathering of information with regard to the different plans and the latest improvements in civil engineering in general, and especially in the departments of harbor and river engineering and irrigation. Prof. Davidson is one of the Commissioners of Irrigation appointed by the Government, and is thoroughly conversant with the needs of California in the matter.

The Professor gave an outline of the subjects which he examined abroad, and stated he would have the pleasure—beginning, perhaps, at the next meeting—to present to the Academy the results of his inquiries into harbor and river improvements, irrigation and the use of instruments of precision. He trusted that the matter would prove interesting and valuable to civil engineers.

Irrigation.

Prof. Davidson stated that in India he had found irrigation carried on in an excellent manner, and on a scale of magnitude of which Americans can form no conception from the descriptions received. The system was a thousand of years old, but the ability of the English engineers had corrected its defects. Their improved methods, the Professor thought, might be used with peculiar advantage in California. He had taken notes of the Egyptian water works, and the disadvantages of the inundation of the Nile, upon which the agriculture of Egypt depends. The country consists of the valley of the Nile, with only seven and a half million acres of arable land, the whole of which is less than the Sacramento and San Joaquin valleys, measuring from where the foothills are three hundred feet. The Egyptians have one crop a year, and that is hazardous, depending upon the rise of the river. Outside the valley are the deserts. The Khedive, as an able ruler, is endeavoring, through his English engineers, to improve the ancient system.

In Italy, on the other hand, the system of irrigation has been so perfected that Piedmont and Lombardy are gardens, with two grain crops and three root crops a year. Their system of reclamation along the lower reaches of the Po is the same as that of Holland, but the defects of their labor system are such that little is to be learned from them, except in the way of details and to profit by their mistakes.

Artificial Harbors and Railroad.

He examined all the artificial harbors in Europe and was glad to note that the engineers were able and willing to describe every detail of construction and give every opportunity for examination. They were also willing to point out the errors they had made, that others might profit by them. He has numerous drawings and details of these works to bring before the Academy.

In railroad engineering he had found nothing in all Europe that compared in boldness of conception and rapidity of execution with our own Central Pacific and Union Pacific roads. The nearest approach to it was in India, in the case of the Bombay railroad, where many weighty obstacles had been overcome. The highest elevation above the sea of that railroad was, however, only 1,500 or 1,800 feet. In the details of some engineering projects he stated that some of the foreigners excel, but that in great ideas and projects we are far ahead. Their embankments in Europe are smoother and their tunnels better, but their efforts seem to have been limited as compared with the stupendous ideas of the Americans.

Europe a Camp.

The Professor, in conclusion of his remarks, said that he returned more Californianized, if possible, than ever. Europe was simply a vast military camp. Every industry is subordinated to the domination of the war power. It reverses the law of the survival of the fittest and depresses everything by the principle of conscripting the flower of the people. He thought Americans should feel peculiarly thankful for that freedom which allows such individual development. And although we are open to the criticism of proneness to self-praise, we may do our boasting with conscious pride. The Professor said he had not seen in Europe so good an attendance of members of scientific societies as was present last night, nor so much interest taken as marked the California Academy, and concluded with heartiest good wishes to all the members.

THE total yield of the Consolidated Virginia mine for the month of February is \$2,800,000—a yield unprecedented in the history of mining, but one which will doubtless be surpassed next month.

TWO new postal cars for the Central Pacific railroad, with all the modern improvements and conveniences, have just been turned out of the railroad shops at Sacramento.

Idaho Mines.

A correspondent who writes us from Placerville, Idaho Territory, says the miners are very jubilant at the prospects of having a good winter season in the Territory. In many places the snow is six feet deep on a level. The Gold Hill mill is running steadily with 25 stamps, and the rock is very rich in gold. They have been sinking this winter and tapped the ledge at a depth of 100 feet, with a rich body of ore in sight. John Eisler is running a tunnel that will tap the extension of the Gold Hill mine at a depth of 200 feet, and the work is progressing very satisfactorily. He expects, in a few months, to be crushing quartz. He has a fine 10-stamp mill neatly fitted up and convenient to the mine, so that he can start up the mill at any time, as everything is in readiness for working. Our correspondent says he is very well pleased with the MINING AND SCIENTIFIC PRESS, and the miners all say that such a paper deserves a liberal patronage.

We hope other of our subscribers in Idaho and elsewhere will follow the example of the one above quoted, and write us whatever items of interest they find leisure to communicate. In Idaho we have many readers, and desire to do the pleasant duty of fairly representing its rich resources. The Idaho mines which are known in this city have been under a serious cloud for some time, but this is without doubt caused more by mismanagement of officials than by any demerits of the mining property itself. Some of the Idaho mines called on the Stock Boards have depreciated in price so as to be almost worthless—an effect produced by the repeated levying of assessments. It has become so bad that people fight shy of Idaho mines altogether, and do not want any stock in them at any price, so that the mines of the Territory are in bad repute.

This is the case, although it is a well known and acknowledged fact that these circumstances are entirely owing to the fact that those who have controlled and managed these stocks for the past few years, and have so manipulated them as to disgust a long suffering community, have only run the mines for stock jobbing purposes. They seem to have run things into the ground with a vengeance. All this has been so bad that a change is about to come, and it is probable that before long the mines will be worked on their merits. The miners have been defrauded of their just earnings, and they seem not to have been able to come to any fair understanding with the owners. The residents of Owyhee have every confidence in their mines, and judging from reports in the local press, which labor hard to keep the merits of the mines before the world, the property is valuable and would pay well if judiciously managed. Our mining summary gives the details of working of the prominent mines at present. We sincerely hope for brighter times for the Idaho mining interests.

A Miner's Suggestion to the Centennial Commissioners.

EDITORS PRESS:—Through your valuable paper I propose to make a suggestion to the Centennial commissioners, whereby the yield of all the mines of this State for the month of May will be placed on exhibition at Philadelphia, in conjunction with that 150 tons of gold and silver bricks which the Consolidated Virginia and California mines are going to furnish.

I understand that the Government purchases the bullion from those mines. Why cannot the commissioners make arrangements with the Government for the purchase of the bullion from all the mines of this State? Let it be advertised in time to be generally understood that such an arrangement can and will be made. Then, let the commissioners solicit all mining companies to make it a point to collect and forward their bullion for said month to some place—say the mint—where its value may be ascertained and paid; small quantities of gold might be collected by the gold dust buyers through the country, and forwarded in the same way. Each company that so chose could have its bars kept separate, and stamped with its name; bars forwarded by dealers could be stamped "miscellaneous."

This whole matter could be arranged with but very little trouble and expense, and would be a great feature of the exhibition, and would do more towards directing the attention of the world to our mines than the enormous exhibits that a few companies will be able to make.

I am a miner, and will be producing bullion at the time here spoken of, and will gladly enter into some arrangement of this kind, and believe that mining men will at once see the propriety of contributing to something of this kind if the way is once marked out and made easy.

With these remarks I submit the proposition to the commissioners, or to any other parties who may deem the proposition worthy of consideration, hoping that such action may be taken in the matter as will make it a successful feature in our national Centennial exhibition.

N. CADWALLADER.

Sweetland, Nevada Co., Cal.

THE Silver State says it is reported that Flood & O'Brien are negotiating for the purchase of the White and Shiloh mine at Galena, Lander county.

Mining Matters in Congress.

Nothing at all affecting the mining interests of the country has occurred during the present session of Congress, except the bill introduced by Delegate Patterson, of Colorado, last month and mentioned by us at the time. Since then the Committee on Mines and Mining to whom it was referred, have reported a substitute for the Patterson bill, which we give below. The bill is to amend Section 234 of the Revised Statutes concerning mineral lands. This section is probably the most important in the mining laws of the United States, since it specifies the method of location and the expenditures required to hold claims, after they are located. It also specifies the legal method of getting rid of non-paying partners in mining claims—a matter of great importance to miners. In order that our readers may understand what the amendments are, we first give Section 2324 of the Revised Statutes:

SECTION 2324. The miners of each mining district may make regulations not in conflict with the laws of the United States, or with the laws of the State or Territory in which the district is situated, governing the location, manner of recording, amount of work necessary to hold possession of a mining claim, subject to the following requirements: The location must be distinctly marked on the ground so that its boundaries can be readily traced. All records of mining claims hereafter made shall contain the name or names of the location, the date of the location, and such description of the claim or claims, located by reference to some natural object or permanent monument as will identify the claim. On each claim located after the 10th day of May, 1872, and until a patent has been issued therefor, not less than one hundred dollars' worth of labor shall be performed or improvements made during each year. On all claims located prior to the 10th day of May, 1872, ten dollars' worth of labor shall be performed or improvements made by the 10th day of June, 1874, and each year thereafter, for one hundred feet in length along the vein until a patent has been issued therefor; but where such claims are held in common, such expenditure may be made upon any one claim, and upon a failure to comply with these conditions, the claim or mine upon which such failure occurred shall be open to relocation in the same manner as if no location of the same had ever been made, provided that the original locators, their heirs, assigns or legal representatives, have not resumed work upon the claim after failure, and before such location. Upon the failure of any one of several co-owners to contribute his proportion of the expenditures required hereby, the co-owners who have performed the labor or made the improvements may, at the expiration of the year, give such delinquent co-owner personal notice in writing or notice by publication in the newspaper published nearest the claim, for at least once a week for ninety days, and if at the expiration of ninety days after such notice in writing or by publication, such delinquent should fail or refuse to contribute his proportion of the expenditure required by this section, his interest in the claim shall become the property of his co-owners who have made the required expenditures.

The above is the original section, which is now the law. Below we give the substitute for Patterson's bill, referred to above, reported to Congress by the Committee on Mines and Mining.

A bill to amend Section 2324 of the Revised Statutes, concerning mineral lands.

Be it enacted, etc., that Section 2324 of the Revised Statutes be amended as follows: Where the words "until a patent has been issued therefor" first occur in the said section, the same shall be stricken therefrom, and there shall be inserted in their stead the following: "Until an application for a patent therefor and final proofs and payment for the claim have been made, as required by the terms of this chapter." And where the words "until a patent has been issued therefor" occur the second time in said section, the same shall be stricken therefrom, and there shall be inserted in their stead the following: "Until an application for a patent therefor, and final proofs and payment for the claim have been made, as required by the terms of this chapter: *Provided*, That where an application for a patent has been filed in the manner prescribed by this chapter, and an adverse claim asserted against the same and suit commenced thereon, the annual expenditure for labor or improvements hereinbefore prescribed shall not be required until the right and title to such claim shall have been finally determined by a court of competent jurisdiction."

It will be seen that the words "until a patent has been issued therefor," limit in the first of the two places above indicated the time up to which an annual expenditure of \$100 is required by the existing law on each claim located after the 10th of May, 1872. Where they occur the second time they limit the duration of the requirement for an expenditure of \$10 worth of labor or improvements every year for each 100 feet of length along the vein of every claim located prior to May 10th, 1872. The sentence after the word "Provided" explains itself.

At the Hale & Norcross mine they spent the whole of last week in pumping the water flowing from the Savage mine, without producing any favorable result whatever.

Mining Debris.

In the State Legislature this week the Assembly Committee on Agriculture presented the following report on the evils resulting from hydraulic mining. They recommend the passage of a substitute bill for that referred to them (which we recently published), and the adoption of a memorial for a Congressional investigation. We shall give next week the report of the Committee on Mines, to whom the same subject was referred, and who will give a totally different showing:

Your Committee, to whom was referred Assembly bill, "An Act to establish a Commission relative to Hydraulic Mining and the damages resulting therefrom," having given the subject such consideration as the limited time at the disposal of the Committee of the House will admit of, we are satisfied that any such consideration is, and of necessity must be but partial, and that the only manner in which it can be treated calculated to do justice to the great interests involved is by adopting the system proposed in the bill, to wit: The appointment of a commission capable of grasping the subject, and with time to treat it fairly, and without doing injustice to either of the interests involved. We find that

In Years past Mining was the Prominent Industry. Almost the only one of our State—that the gold hidden in our mountains and along our streams was the only inducement to us who came here in early years, that it was thus enabled and allowed to overshadow all other industries, to take within its grasp the right appertaining to tillers of the soil, until it became a maxim that no farmer or horticulturist had any rights which the miner was bound to respect. This feeling largely influences our thoughts even to the present time, and permits the miner to work down the hills and the mountain side, depositing the tailings, the sand, gravel and boulders on the valley lands below him. It is a principle of law "that no man or body of men have a right to follow any calling or industry which inflicts damage or wrong on other men." Yet this has been done for years, and notwithstanding the immunity from damages inflicted on others we find the production of gold steadily on the decline.

The Damage Specified.

Your Committee find from evidence adduced that the valleys of the American, Bear, Feather and Yuba rivers commenced to be injured by the detritus from the hydraulic mines about the year 1862. That the owners of lands in the river bottoms did for a series of years and at very great expense hold the increasing debris in check, by levees, until the spaces between these rivers became filled up. The water would then break through the levees, carrying the sand, gravel and cobble-stones upon the lands, destroying their fertility, rendering lands once the richest in the State unproductive and valueless. This system has continued until nearly all the valuable bottom lands of these rivers have been utterly ruined. Where once stood fine mansions and pleasant houses, rich orchards and fields, smiling with golden grain, is now to be seen but sterrenness and desolation—a sandy waste. We find that the lands so destroyed were worth many millions of dollars; that their ability to return a revenue to the State has ceased. But this is not all. The destruction is but commencing, for hydraulic mining is but in its infancy and the science and appliance brought to bear enable the miners to literally move the mountains into the valleys, and so rapidly that only the costly levees built on the west bank of the Feather river prevents the large and fertile territory in Sutter county from being destroyed, but the deposits from the mines is increasing at so rapid a rate that the levee system is becoming almost unavailing, rendering it impossible to preserve for agriculture a territory whose annual production exceeds the gold product of all the hydraulic mines of the State.

Inevitable Result of Continuing the System—The City of Marysville.

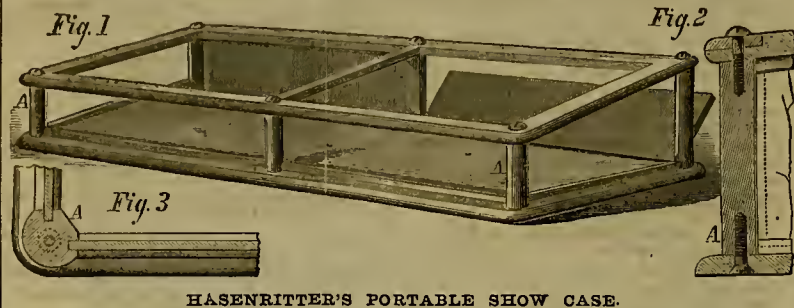
This territory in Sutter county will be irrecoverably lost to its owners and to the State, impairing its revenues, lessening its productivity and deterring immigration. Nor is it merely by destroying our valley lands that the present system of mining is destructive. The beautiful city of Marysville, 15 years the third city of the State in population and wealth, is now from this cause alone reduced in wealth and population to the rank of ninth or tenth. Having the best natural situation of any of our interior cities—at the confluence of the navigable streams, sitting on a plateau rising 30 feet above the level of the streams flowing at her feet, and surrounded by extensive and highly fertile territory, she once bid fair to become the chief inland city of the State. But the mountains began moving down upon her, filling the beds of her crystal streams with mud, until now the rivers above which she proudly sat look down upon her streets, menacing the lives as well as the property of her citizens. A year ago the city was inundated, and \$1,000,000 worth of property destroyed. At the cost of thousands of dollars a new levee has been built, but the turbid streams already threaten its existence.

The report continues: "We find that the present system of mining destroys by a double process; first, by covering the alluvial lands of the valley with the debris from the mountains, and secondly, by stripping the hills and moun-

tains of their trees and vegetation, thus removing the soil and leaving but the bare rock. This prevents all productivity in the future. The effect this may have upon our climate for evil is yet to be determined, but can scarcely be estimated from any data at hand. During this period, while the mining interest has steadily declined—while the annual gold product has fallen from more than \$60,000,000 to about \$17,000,000, the agricultural interest has steadily and rapidly increased until now its products exceed in value the gold product of the most prosperous year.

Value of the Property Destroyed.

The report, after expatiating at length upon the place of agriculture in the State's economy, proceeds: "Evidence has been adduced, and no attempt has been made to controvert it, that in the valley of the Yuba there has already been destroyed and abandoned 29 sections of land, worth more than two millions of dollars; on the Bear river, 36 sections, worth at the lowest estimate \$1,500,000; on the Sacramento, 16 sections, valued at \$750,000; on the Feather river, eight sections, worth \$500,000; and on the American river, 10 sections, worth \$600,000 and on other smaller streams some 22 sections, worth \$1,000,000, making a total in lands above \$6,350,000. The improvements on these lands—houses, barns, fences and orchards, all that go to make homes for a thrifty and industrious people, were worth fully as much more or a total of \$12,700,000. The lands thus already



HASENRITTER'S PORTABLE SHOW CASE.

rendered unproductive amount to 77,450 acres. Estimating the annual productive value of these lands at \$30 per acre, the amount of \$2,323,200 is annually lost.

Another Evil Impending.

It is not only the lands bordering on smaller streams that are threatened. Another, and to many minds a more serious evil, is impending—the filling up of our navigable streams, unfitting them for purposes of transportation, depriving us of the great natural highways for cheap freights; the gradual filling up of our magnificent bays, with the inevitable shoaling of the entrance to the harbor and bay of San Francisco—the gateway for all products, our chief means of communicating with the world. We find that some of our rivers already, at the point of debouching from the mountains, have been raised above their nominal level from 70

feet to the waters leave the foothills, thus allowing nothing but the lighter sediment to be carried to the valleys. The committee is not prepared to advocate any plan, believing that sufficient data and statistics have not been collected upon which can be predicated legislation. In conclusion, the committee recommends the passage of the bill in order that the necessary information be obtained.

Portable Show Case.

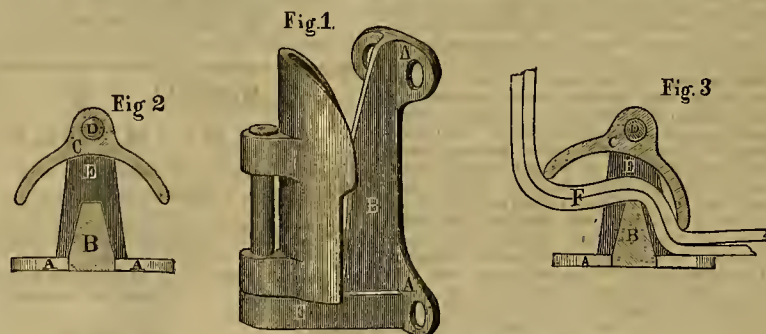
There exists at the present time, among those who purpose exhibiting goods at the coming Centennial, an increasing demand for simple, portable devices adapted to holding articles while displaying the same to good advantage. We illustrate on this page a show case which is designed to be boxed up with the goods before forwarding, so exhibitors can be sure that their display will be well secured.

The advantages of the invention, which is represented in perspective in Fig. 1, are that it is composed of a number of easily detachable pieces, which allow of its being packed into small compass, and which, when set up, form a strong case, the joints of which cannot work loose through the effects of dampness.

As shown in the sectional views, Figs. 2 and 3, the posts, A, are attached to the bottom of

the case by screws, and in their sides grooves are formed to receive the ends of the panes of glass. On the under side of the top and on the upper side of the bottom are fastened small strips, which also have grooves to receive the edges of the glass and besides serve to brace the posts in position. The top is also attached to the post by screws, and by removing it the glass may be easily disengaged, the doors which are hinged to the rear part of the bottom taken off, and the whole case thus separated into several portions.

The device thus constructed, it is claimed, may be more cheaply and easily made than those not constructed to take apart. The case may be made of any shape, upright, octagon or round. The posts and strips can be produced in long pieces, like molding, and polished and finished before being cut. The bot-



A NEW REIN HOLDER.

tom to 100 feet, while 20 or 30 miles lower down in the valleys they have been raised but from 20 to 30 feet. This has given a greater fall to water and greater rapidity. The consequence is that heavier material is borne further down, and shortly we shall see the advancing columns of coarse gravel, rock and heavy detritus pushing into the bay. The quantity is so great that it is estimated by one of our most accomplished engineers (Mr. Arnold) to be sufficient to cover in one year one square mile to the depth of 41 feet three inches, or to fill Suisun bay to the line of low water in a period of 15½ years, and San Pablo bay to the same line in 30½ years.

Mining and Agriculture Compared.

The report continues: The lands the mines destroy would be valuable for ages to come. The people engaged in agriculture instead of destroying are steadily enhancing the value of their lands. They build permanent houses and add continuously to the productivity, the wealth and revenues of the State. Wise statesmanship demands that the permanent industry shall not be injured by the transient industry, and that the tiller of the soil shall be protected and fostered.

The Remedy Suggested.

In the opinion of many whose views are entitled to great weight, it is quite possible to regulate mining so that it will not injure agriculture. This can be accomplished by precipitating the heavier portions of the tailings be-

The 'Frisco Rein Holder.

When a teamster wants to stop he pulls the reins and his horses are drawn back so that they cannot stretch the traces. Some exceptional horses can draw a light wagon by the bit, but the strain is so great that they will not go either fast or far, and ordinarily will stop so soon as they find that the draft is thrown on the mouth, and not on the shoulders, where it should be. These facts are the basis of the rein holder, a device to keep the reins in the position in which the driver places them when he stops. Having thus fastened the reins, he can with safety leave his team anywhere far from a hitching post.

Several kinds of rein holders have been made, but that called the "'Frisco rein holder," invented by Jefferson Kindelohger and patented March 10th, 1874, is the smallest, lightest, simplest in construction, the most convenient for use and for fastening to different vehicles, and the cheapest. It is made of malleable iron or brass, weighs from two to four ounces and costs from 50 cents to \$5—the last the price for plated work. There are different patterns, suited to various vehicles and positions, not for catching leather straps only, but also clothes lines, ropes, cables, shoe strings, etc.

The illustration by our engraver shows the rein holder in three positions. Fig. 1 represents it in perspective, as it may be fastened by screws to the front of a wagon bed, or with the help of clamps on the front of the iron frame of a heavy dash-board. Fig. 2 represents a cross section of the same rein holder empty. Fig. 3 represents the same gripping the reins. A the hook, B the tongue, and E the base, are cast in one piece. C the crescent—the convex side of which is turned towards the horses—swings on the pintle D, and whenever the reins are pulled, presses them against the tongue B and holds them fast; the harder the pull, the tighter the grip. Every vehicle, header, harrow, plow, cultivator, and other article drawn by horses should have a rein holder, even if only to keep the lines out of the dirt. The driver can slip the lines in or out without effort. The patent, obtained by Dewey & Co., patent agents, is the property of J. S. Hittell, 529 California street, S. F.

NEW QUARTZ MILL.—We have examined this week drawings of a new quartz mill now being made in Sacramento by Cowles & Cooper, one of them being in operation in Tuolumne county. It is built on the principle of the Chilean mill, but with many improvements. Only one crushing wheel is used, and on the other end of the shaft, where the other wheel would be in a Chilean mill, is a unique device for stirring up the quartz and assisting amalgamation of the gold or silver. The power is applied to the rim of the wheel, which is neither suspended or driven from its center. It is geared in an ingenious way, so as to take little power to run the 16,000 pound wheel. The wheel, from its peculiar motion, grinds as well as crushes the ore. The mill now in use in Tuolumne county is said to crush about 35 tons a day through a No. 50 screen. The shoes of the wheel and bed plates are made of hard cast steel and will wear a long time. The device is quite simple, and the manufacturers inform us that they have a number of orders to fill as soon as the roads in the interior are in fit condition for hauling heavy freight. We shall give a detailed description and illustration of this new quartz crushing appliance in our next issue.

THE STEAMBOAT SPRINGS COUNTRY.—The Steamboat springs country is a singular place. Not only are they finding cinnabar there in large quantities, but they have also discovered, among other curious things, a paint mine, where the paint is said to be in streaks of various colors, and feels like white lead ground in oil. In places where sulphur digging is going on, the ground is so hot at a depth of three or four feet that the sulphur found can scarcely be held in the hand. The cinnabar excitement runs high, and claims are being staked off in every direction. Numerous sulphur claims are also being located. In some places solid masses of sulphur are reached upon the removal of from three to five feet of surface soil.

THE BOILER INSPECTOR BILL.—The Assembly San Francisco delegation report a substitute for Pullen's bill to appoint an Inspector of Stationary Boilers in San Francisco, which we published last week. The substitute leaves the appointment with the Supervisors. The Inspector is to give bonds in \$10,000. He is given power to license engineers, and to extract a fee of \$2 for each license. The fee for inspection is put at \$3 for each boiler. He is to provide all requisite machinery for carrying on the work of inspection, and the first Monday in May next is fixed for the time when the act shall take effect.

THE recent snows are interfering quite seriously with the transportation of ore to some of the mills outside of Virginia City, such as can only be reached by wagons. There is no trouble, however, in regard to keeping a full supply at all the mills on the railroad and its branches, and at all these mills there are now considerable accumulations of ore.

The Eames Quicksilver Furnace.

A recent number of the *Russian River Flag*, in recording the proceedings of the annual meeting of the Mount Jackson mining company says: The remodeled furnace of this mine is working as well as any, where the fire passes through uncrushed rock, but like all others of the class, fails to work up the dirt satisfactorily. Therefore arrangements have been made with the patentee to have three Eames furnaces erected at once, which will not only work the dirt, but also the rock. Mr. Eames' progress in bringing his furnace to perfection has been observed by the Mount Jackson company with the intention if successful to have him at once construct several of them at their mine. Mr. Eames' success justifies the above action, and a greatly increased product from this mine may be expected.

In another part of the same issue the *Flag* says: The Eames furnace is a success—and the problem how to make our quicksilver mines pay is solved. By reference to an article in another column headed "The Mount Jackson mine," and also to a statement given below, it will be seen that this furnace is not only endorsed, but also proven a success. A revolution is evidently at hand in our quicksilver mining interests. The many mines in the respective districts of which Healdsburg is the central point, which although known to be rich in cinnabar or native quicksilver have been shut down, and some abandoned, on account of failure to extract the metal, will now be revived and rendered active again, by the use of the new furnace. By its use, such rock or dirt as has heretofore been regarded as waste can henceforth be worked at a profit. Its cost is much less than any yet constructed in our mines; it is self-feeding and self-discharging; roasts either dirt or rock and the dirt does not require to be made into adobe; it is economical, as an eight-ton furnace burns but half a cord of wood per day of 24 hours, and it extracts mercury to the full assay of the rock. The scientific principle is that the regulation of air in the furnace is so nice and under such perfect control that exact oxidation takes place, and nothing but pure mercurial vapor passes into the condenser, and being pure is rapidly reduced to the liquid state, and upon being extracted leaves no debris behind.

An experimental run of 28 days has just been made at the Great Eastern mine, with the following results, for which we are indebted to Mr. Eames, the patentee:

Dirt run through, 77½ tons; deducting 16 tons for water contained in it, leaves 61½ tons; yield of quicksilver, 1,886 pounds. Three tons of ore produced 358½ pounds of quicksilver. Four tons of dirt from the Mount Jackson mine, also containing 20 per cent of moisture, yielded 87 pounds of quicksilver. Much of the dirt run through has been rejected as waste, although some from the Great Eastern was excellent ore; that from the Mount Jackson was all indifferent dirt. Elsewhere, it will be seen that the Mount Jackson company have ordered three of these furnaces, with aggregate capacity of 30 tons per day, to be constructed at their mine at once. The patentee has contended with many difficulties, failure often staining him in the face, and he now has our congratulations on the perfection of his invention. Mr. Eames has moved his family to Healdsburg, where his permanent headquarters are established.

Mining Decision.

The Secretary of the Treasury, under the date of Washington, February 15th, has forwarded to the Commissioner of the General Land Office his decision in the case of the Hawley Consolidated mining company against the Memnon mining company:

Sir: I have carefully considered the case of the Hawley Consolidated mining company vs. the Memnon mining company, on appeal of your decision of April 3, 1875, upon an application of the Memnon mining company for a patent of twenty-two hundred feet of the Sheridan lode, Devil's Gate mining district, Lyon county, Nevada.

The application of the Memnon mining company was filed at the local office February 23d, 1874, and with the accompanying proofs shows that the Memnon mining company has the record title to the tract claimed, and that it has complied with general and local mining laws.

Robert Apple, claiming to the act by the authority of the Hawley Consolidated mining company, on the 23d of April, 1874, on behalf of said company, filed a protest to said application, alleging that the Hawley Consolidated mining company was the owner of the premises therein described.

There is nothing in the case showing that Mr. Apple had any authority to file said protest and give notice of an adverse claim except the statement in his affidavit that he had authority, nor does it appear by his affidavit or otherwise that he is a member of the company in whose behalf he appears.

A mere allegation of authority is not sufficient; the authority to act must be shown. In the case of the Eureka mining company vs. The Jenny Lind mining company et al., decided November 24th, 1873, it was held "that the jurat to the adverse claim required by the seventh section of said Act [Act of May 10th, 1872,] must be made by the party, and cannot be made by an attorney. (Copp's Mining Laws, p. 169.) When, however, the party in

interest is an incorporated company, which can only act through an agent from the necessity of the case, this rule must be somewhat modified.

In such case the company may verify its protest by the oath of its President or other executive officer, or it may by letter of attorney appoint some proper person to act for it, who would then be clothed with sufficient power to make an affidavit. Without such authority a person not an executive officer of the company would have no right to act, and whatever he might do in its behalf would be invalid and should be so regarded.

The location under which the Hawley Consolidated mining company claims title was made long prior to the location under which the applicant claims, and from the abstract attached to the protest it appears that said company have the record title to the tract described in said location. There is nothing, however, in the protest and affidavit filed by Mr. Apple, if treated as competent, to show that the Hawley Consolidated mining company have complied with the general or local mining laws since the location of their claim or that it was a valid substituting claim at the time the grantors of the applicant made their location. It appears that the Sheridan lode and the Newport lode are substantially the same, and by the certificate of the Deputy United States Surveyor it appears that the value of the labor and improvements on the Hawley Consolidated mining company's claim on said Newport lode exceeds \$500.

This may be true; but there is nothing to show that said company or its grantors performed the labor or made the improvements. It does appear that the Memnon mining company performed labor and made improvements on its claim, and at the filing of its application was in possession thereof. The lodes being substantially the same, the surveyor could truthfully certify as to the value of the labor and improvements without knowing who caused them.

While the adverse claimant is not found in his protest to show a strict compliance with all of the mining laws and the usages and customs of mining districts, still he should show enough to make it clear that he is acting in good faith.

The abstract filed by Mr. Apple shows a record title in the adverse claimant of a tract 200 feet in width, while the diagram thereto attached and made a part of the protest represents the claim as 300 feet in width.

The nature of the adverse claim is sufficiently shown, but its extent and boundaries are very indefinite. For these reasons, without considering other apparently equally fatal to the adverse claim, I affirm your decision.

The papers transmitted with your letter "N" of July 24th, 1875, are herewith returned. Very respectfully, Z. CHAMBERLAIN, Secretary.

To the Commissioner of the General Land Office.

Butte County Mines.

For the past few weeks we have been unable, for want of space, to give attention to the mining interests of the county. While here and there nuggets of gold are found that attract attention for a short time, they form no part of the great harvest that is being gathered winter after winter, or rather year after year, for since water has been brought to the larger claims, full as much is taken out in a summer month as during the same time in winter. At Cherokee Flat the Spring Valley company are at work in rich ground with a full crew of men, and are meeting with their usual success. Last year they took out almost a half million dollars' worth of gold; this year they will run off a great deal more dirt and expect much larger returns. Mining with them is a life business. They have an abundance of ground and it is rich. The Hendricks mine in Morris ravine still yields its accustomed returns. Here are lumps of gold that are beautiful to look at. They lie thickly strewn over the bedrock. Day and night work is carried on and gold taken out. This mine, too, is very extensive. Across the river at the old West claim extensive preparations are being made to carry on the business of mining as it should be done. Three-fourths of a mile of 22 inch pipe will soon be in place, with the latest improved chiefs, to send the water against the bank with a force sufficient to melt it away like snow before the rays of a tropical sun. It is the opinion of men long acquainted with the ground, that the price of the claim—\$45,000—will be taken out during the coming summer. Right here in town, within gunshot of this office, is the claim of J. B. Hewitt, that yields a constant harvest of gold. Two four-foot flumes from the claim to the river, one-fourth of a mile, are employed all the time in carrying off the dirt from the claim and catching and holding the gold. From McSmith's claim in the mountains we have most cheering reports. He has an immense bed of gravel, part of it a river bed that is literally strewn with gold. Water was what was wanted to bring it to light. He had plenty of fall, plenty of timber and lumber, but no water. A little while spent in surveying and the thing was done. He found it in abundance and now has on the claim as large a stream as any claim in the county can boast of. Two hundred thousand dollars have been offered and refused. He has a bonanza and knows how to keep it. All through that part of the county are locations made by capitalists below, who find here the best and safest places to invest their surplus capital. Butte will yield a quarter of a million dollars' worth of gold more this year than last.—Oroville Mercury.

Banking.

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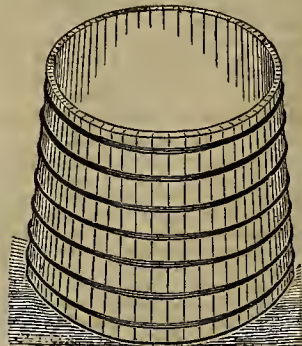
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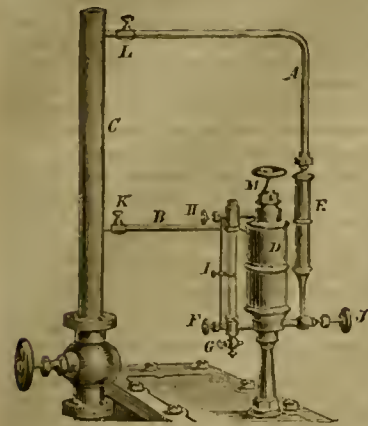
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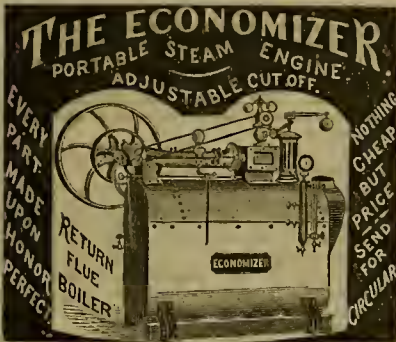
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Awarded by the Mechanics' Institute Fair, San Francisco, and State Fair, Sacramento, 1871.

These Lubricators are acknowledged by all engineers to be superior to any they have ever used; feed constantly by pressure of condensed water supplied by pipe A, regulated under the oil by valve J, and forced out through check valve and pipe B into the steam pipe C; it then becomes greasy steam, passes to all the valves and cylinder at every stroke of the engine; glass tube I indicates amount used per hour. Packing on rod and stems lasts longer, and the rings on the piston will not corrode. One pint of oil will last from three to six days, according to speed and size of engine; I, sliding gauge; K, valve to shut off when engine stops; H, F, valves to shut off in case of frost; steam does not enter the cup; it is always cool; warranted to give satisfaction. Patented February 14, 1871. Made by California Brass Works, 125 First street, S. F. 24V23



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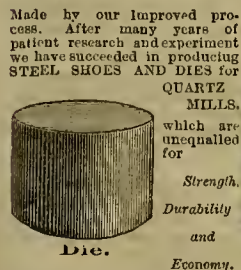
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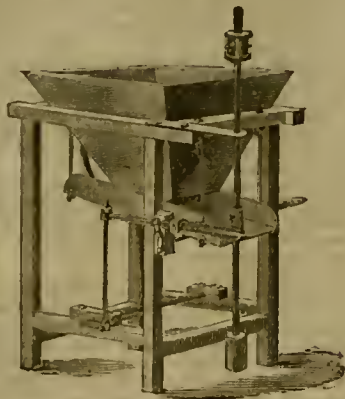
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Increase the Capacity of each Battery Two to Three Tons per day.



SAVE LABOR! SAVE MORE GOLD!
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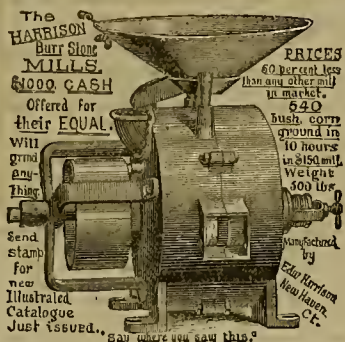
One Man Can Attend to a Hundred Stamps.

WILL FEED ANY KIND OF ORE.
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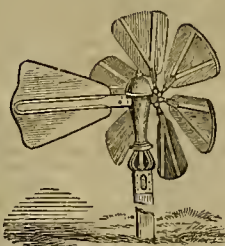
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Advertisement for FRASER, CHALMERS & CO. featuring various machinery including steam engines, boilers, stamp mills, crushing rollers, amalgamating pans, and machinery for systematic milling, smelting, and concentration of ores. It also mentions agents for Blake Stone Breaker, Jeffell & Water Wheel, and flour mill furnishing. The address is Chicago, Ill.



G. W. & C. A. LANE, Exeter, N. H., write, Dec. 13: "We started the heavy 20-inch Corn Mill last Friday you sent to Baldwin & Tabor, Manchester, N. H. We ran it most all day, and ground 60 bushels corn per hour. The mill you sent us at Haverhill, Mass., for A. S. Hook, is doing wonderfully. It is grinding on an average 2,500 lbs. good meal per hour, and has ground 2,500 lbs. in an hour. It is driven by an engine with a 9-in. cylinder, and takes the place of a 30-in. mill of another kind that, when doing its best and loading the engine with all it could carry, only ground 1,500 lbs. per hour. If there is a mill built that can beat that we would be pleased to see it brought out."

AUTOMATIC PUMP.



Raises water by compressed air to any height or distance. Windmill can be set at any distance from the well or spring if required to get a good exposure to the wind.

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The Ingersoll Rock-Drill



Is Extensively Used in the East and

TAKES THE PLACE OF ALL OTHERS, Whenever introduced, because it can run with less power, labor and repairs, and do more work than any other drill in the market. It has but few parts, is easily handled, being light, and HAS AUTOMATIC FEED, which saves labor. WE ASK FOR TRIAL AGAINST ANY COMPETITOR. For particular information regarding Drills or Air Compressors, send for circular to

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MODEL STEAM ENGINES.

From 50 cents upwards, from Geo. Parr's Unequalled Models of

Steam Cranes, Vertical Engines, Circular Saws, Paddle Engines, Steam Lathes, Steam Hammers, Horizontal " Steam Boilers, Locomotive Engines, Portable " Steam Pumps, Marine Screw " Beam " Steam Winches, Powerful " Electric " Fire Engines, Water Motor " requires no fuel Unright Engine, Miniature Mach. Shop Engines to run with Kerosene Oil or Gas for domestic purposes. Miniature Mechanical and Comical Figures and Saw Mills run by above appliances. Also, Celebrated Amateur's Lathes, Tools and Fixtures of every description. Inimitable Castings for \$1.00 per set and upwards, by means of which numbers of the above Steam Engines, Lathes, &c., have been successfully made by Amateurs. Thousands prove the unparalleled success of the above models and castings. For full descriptions and prices of the above, together with the requisite tools, see "Parr's Technical Guide," 8vo, Eighth edition, sixty-four thousand, over 150 pages with nearly 500 splendid illustrations, giving full instructions in Sorrento Pot Carving and Carving, and 150 Parlor Experiments in Chemistry, the wonders of Microscopy, the beauties of model Telegraphy, together with other useful and scientific information; all of all necessary instructions how to buy, how to use, and how to make model engines. Post free, 30 cents Address GEO. PARR, Manufacturer of Mechanics' Tools, ROCHESTER, N. Y. DENHAM, CARRIGAN & CO., S. F., are Sole Agents in California for my Heavy Wood Working Machinery

STEAM ENGINES & BOILERS

From 3 to 75-horse power. Shafting, Pulleys, Hoist Gears, Quartz Mill, Water Tanks, Spanish Arastras, Pumps and Pipes, Hoopers and Belden Pans, and all kinds of Machinery for sale at lowest prices by

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Saves 15 to 30 per cent. in Fuel.

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FIRE AND WEATHER PROOF.

Asbestos Steam Packing,

Made from Pure Long Fiber Asbestos,

INDESTRUCTIBLE! SELF-LUBRICATING!

Keefe's Boiler Compound,

Prevents the formation of Scale in Boilers and removes the same, without injuring the iron or causing the water to foam.

37 Circulars, Descriptive Pamphlets, etc., Sent Free.

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Clothing,

14 & 16 Battery St.,
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These goods are specially adapted for the use of FARMERS, MECHANICS, MINERS, and WORKING MEN in general. They are manufactured of the Best Material, and in a Superior Manner. A trial will convince everybody of this fact.

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J. W. QUICK, Manufacturer of perforated sheet metals of every description, at reduced rates. Mill owners using Battery Screens extensively, can contract for large supplies at favorable rates. This is the only establishment on the Coast devoted exclusively to the manufacture of Screens

Barnes' Patent Foot and Steam Power Scroll Saws and Lathes.



For the entire range of Scroll Sawing from the finest ornament to the coarsest bracket, three inches thick. WARRANTY.—We warrant that a man with ordinary experience can, with this Foot Power Machine, saw through the following kinds of lumber: 1 in. thick, 1 foot per minute; 1 in. thick, 4 ft. per min.; Walnut, 3 in. thick, 2 ft. per min.; 1 in. thick, 2 ft. per min. Address for full particulars, W. F. & JOHN BARNES, Rockford, Winnebago Co., Illinois.

MINING ENGINEER.

A Mining Engineer, with the best of best of reference, thoroughly experienced in the opening and superintending of mines and mills, desires an engagement Address, "MINING ENGINEER," MINING and SOLENTIFIC PRESS Office, San Francisco.

PATENTS & INVENTIONS.

A Weekly List of U. S. Patents Issued to Pacific Coast Inventors.

FROM OFFICIAL REPORTS FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.]

By Special Dispatch, Dated Washington D. C., Mar. 7th, 1876.

FOR WEEK ENDING FEBRUARY 22d, 1876.*

CONDENSER FOR FUMES OF MERCURY.—Charles B. Dahlgrn, S. F., Cal.

HARNESSE TRIMMINGS.—William Davis, Petaluma, Cal.

CLUTCHES.—Philip Hinkle, S. F., Cal.

REFRIGERATOR.—Edward K. Howes, S. F., Cal.

ANIMAL TRAP.—Albert J. Larson, S. F., Cal.

FISH SCALER.—Sarah Lawton, S. F., Cal.

REAPERS.—David Palmer Russell, Dixon, Cal.

VEHICLE SPRING.—Harry K. Waterhouse, S. F., Cal.

HANDLE ATTACHMENT FOR BRUSHES.—Henry Andersou, Vallejo, Cal.

TRADEMARK.

THROAT OR BRONCHIAL AFFECTIONS.—Georgs F. Roberts, S. F., Cal.

*The patents are not ready for delivery by the Patent Office until some 14 days after the date of issue. NOTE.—Copies of U. S. and Foreign Patents furnished by Dewey & Co. in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of mention:

IMPROVEMENT IN CONDENSERS.—Chas. B. Dahlgrn, S. F. This is an improved condenser for cooling heated vapors or fumes to a temperature at which they are precipitated or become liquid and it consists in constructing the condensing chamber, either partially or wholly, of an absorbent material, which is kept constantly saturated with water, so as to produce a refrigerating effect inside of the chamber by the evaporation of the water from the surrounding surfaces. In the patent this inventor represents the application of this improvement in connection with an ordinary retort for separating quicksilver from gold and silver amalgam. The usual retort or open basin is used, with a furnace below. Upon the base of the retort is constructed a simple framework, which is capable of supporting a housing which is made of absorbent material, such as canvas, woolen, cotton or other fibrous or equivalent textile fabric which will absorb water. In this base is made a channel which extends entirely around the basin, and this channel is kept filled with water. The housing is so suspended or adjusted that its lower edge will enter the water in this channel and thus prevent the escape of any of the vapors or fumes beneath it. Above the housing are led perforated water pipes, in such a manner that they will deliver a constant spray or stream of water upon the housing and thus keep it saturated. The surplus water will flow down the sides of the housing and be caught in the channel, into which the lower edge of the housing dips, and a waste pipe is supplied to carry away the surplus water from the channel. The evaporation of the moisture from the housing will create a refrigerating action inside the chamber, inside of which the fumes are generated or delivered, so that they will be condensed against the inside of the housing and flow down its sides into the channel; or inclined planes or shelves may be arranged inside of the chamber, upon which the condensed material will settle and be directed by them into the channel. The inventor claims that a condenser of this kind can be cheaply constructed and its action will be superior to that of any of the ordinary methods of condensing vapors.

REFRIGERATOR AND WATER COOLER COMBINED.—E. K. Howes, S. F. This is a cabinet or chest, which is adapted for use, both for the preservation of meats, fruits, vegetables and like substances, and as a water cooler to supply water for drinking purposes. We described and illustrated this device in a previous issue of the Press. It is a simple and convenient arrangement of the ice and water chambers, so that they will be out the way and not interfere with the space allotted the articles or substances to be preserved. It also improves the construction and disposition of ice and water chambers by which they are rendered more convenient and effective.

HARNESSE PAD CHECK HOOK.—Wm. Davis, Petaluma. This is an improvement in harness pad check hooks, and it is intended to be especially applicable to double or single harness, in which a flexible pad with no metallic stiffening is used, and where no terrets are employed to guide and support the reins. It consists in the employment of a low, flat hook, which is riveted between the two parts of the pad trap, and is provided with a tongue actuated by a spring so as to retain the check rein in its place in the hook, and so placed as to form a guard to prevent the reins from becoming entangled with this hook.

FISH SCALER AND SCRAPER.—Mts. S. Lawton, S. F. This is a cheap and convenient hand implement for removing scales from fish and for scraping them after the scales are loosened. This handle has a head or cross bar across one end. The blade is of thin metal, one edge of which is provided with teeth similar to saw teeth, while the other edge is plain. This blade is bent in a semi-circular form, and its ends are secured to the opposite ends of the head or block, thus forming a scraping tool which can be very conveniently handled. To the opposite end of this handle is secured one end of a cord, which is of any desired length, and to the opposite end of this cord is a long pointed rod or spear. In cleaning the fish this spear is forced through the tail and the point pressed into the table underneath. Or if desired, the spear can be driven firmly into the table or board upon which the fish is cleaned, and another spear can be passed through the gills of the fish and into the table, thus firmly fixing the fish in position. The operator then takes the cleaning implement and loosens the scales with the toothed edge of the blade by drawing it over the body of the fish from the tail to the head. When the scales are loosened the implement is turned over and the fish scraped with the plain edge, thus thoroughly cleaning it. The spear and cord can be dispensed with if desired, but the work is done perfectly with them.

FRICTION CLUTCH.—Philip Hinkle, S. F. This invention provides an improved clutch, to be used where it is necessary to allow a shaft to turn freely in one direction and either wholly prevent it from moving in the opposite direction or cause it to carry with it some attachment. This clutch is intended to operate without any pressure upon the rim and without any undue or indirect strain upon the hub, its action being that of a monkey wrench. It consists of an outer rim and one side of a case which turns loosely upon a shaft, this side having a flange projecting inward from it. The other side of the case is fast upon the shaft and has an interior hub from which loose arms project towards the circumferences. These arms are notched or grooved to fit over the flange upon the opposite side, and they move loosely over it in one direction, but are cramped upon it when moving in the opposite direction. By this construction the inventor is enabled to make a clutch which acts instantly, with no slip, and he avoids the difficulty of too great a pressure upon the rim, which is liable to be hurt by the strain.

IMPROVEMENT IN PANTS AND OVERALLS.—Herman Adams, S. F. This invention provides certain improvements in the construction of pants and overalls, and consists in the formation of a pocket which is sewed upon the outside of the article, in one piece, with this button stays, which are above it, and this hack or buckle strap; and by this the inventor claims to save much expense of labor and thread which is expended on sewing on separate pieces. This pocket is cut in a peculiar shape with an extension that serves as a hack or buckle strap, all in one piece. This pocket is cut and laid upon the article in the proper position and is stretched around its edges, the stretching being continued along the buckle strap, the whole being continuous. By this construction the inventor is enabled, with proper machinery, to cut large quantities of these combined pockets, straps and stays with but little waste of material, and when the stretching is done much time is saved, and the whole presents a neat and serviceable appearance.

CARRIAGE SPRINGS.—Henry K. Waterhouse, S. F. This invention relates to an improved arrangement for combining semi-elliptic side springs with end C springs, in the construction of buggies and carriages, so as to provide a swinging, or back and forth motion, and at the same time improve the vertical action of the springs. The combination of the side and C springs gives an easy vertical action, while the motion of certain crank rods will relieve the stiffness or rigidity of that motion and give an easy swing to the body. This arrangement also connects the action of the side springs so as to produce an equalizing effect, as the spread of one of the side springs by a weight placed upon one side of the buggy body will cause the crank rods to swing outwards; and thus depress the opposite spring, thus obviating the disagreeable effect of tipping the body to this side which supports the greater weight.

ANIMAL TRAP.—A. J. Larson. This trap is essentially a gopher trap, as it is intended to meet the peculiar habits of that animal. When an opening is made in a gopher's hole this sagacious rodent gathers up a quantity of dirt in front of him and with this material as a bulwark, proceeds to close the opening. An ordinary trap in this case would only "bite dirt." This trap is intended to circumvent the gopher by giving him a chance to get his dirt into the opening and himself into the trap before it closes upon him. The animal is caught in the loop of a flexible wire, which projects into the hole from one or more spring barrels or followers and is set so as to allow the body of the animal to get into the loop. When the dirt has been put in position by the gopher he is in position to spring the trap, which draws the loop closely around his body and holds him in the firm embrace of death.

Gems and Precious Stones.

[Written for the Press by HENRY G. HANKS.]

(Continued from last week.)

Again fill the bottle with distilled water, the stones remaining inside; the same precautions must be used as in the first instance. It may be found necessary to half fill the bottle first, and to shake it well to remove air bubbles; then to fill it brimful and to replace the stopper as in the first instance. The excess of water will flow out through the little channel made with the file, leaving the bottle perfectly full; it may then be wiped dry on the outside and again weighed; mark this weight "C."

"A" is the weight of water that the bottle will hold when filled to its utmost capacity. This weight may be marked on the outside of the bottle with a writing diamond, as it will always remain the same.

"B" is the weight of the stones dry. "C" is the weight of this water which is required to fill the bottle after the stones are placed in it, and the stone.

Subtract "B" from "C" and what remains represents the weight of the water which would be left in the bottle if the stones should be dropped into it when brimming full; let this quantity be represented by "D."

From "A" subtract "D," and this weight of the water displaced by the stones is obtained, which is exactly equal in volume to the stone; let this sum be known as "E."

Now if "B" is divided by "E," the result is the specific gravity of the stones. This is very simple when it is well understood. An example will suffice to make it clear.

Let "A" = grains..... 25.36
Let "B" = grains..... 6.21
Let "C" = grains..... 27.40

From "C"..... 27.00
Subtract "B"..... 6.21

"D"..... 20.79

From "A"..... 25.36
Subtract "D"..... 20.79

"E"..... 4.57

Then—

"B" 6.21 = specific gravity = 1.3583+

"E" 4.57

When distilled water cannot be obtained, melted snow or rain water will do, and even river water will give correct results, but salt water or mineral water of any kind is inadmissible. When great exactitude is required the temperature of the water should be sixty-two deg. Fah., or as nearly so as possible.

(6) Electricity. Pliny was the first to notice this property of minerals. There are two kinds of electricity—positive and negative. It is a law of physics that bodies similarly electrified repel each other, and that bodies which do not possess the same kind of electricity attract each other. Some minerals become electrical by friction, others by heat (pyro-electric), others cannot be excited at all. There are therefore three distinct divisions of minerals by electricity alone. Where a mineral can be electrified by heat it sometimes shows the presence of the fluid in two forms. One end of a crystal may be positive while the other is negative.

Minerals which become electric by rubbing on silk or woolen cloth, will attract bits of gold leaf, or will turn a delicate electrometer. The electrometer is a simple instrument. It consists of a metallic base terminating in a fine point; on this point a delicately balanced copper wire is placed. The ends of this wire terminate in small balls of the same metal. In the test instrument the socket which turns on the metallic point is made of agate, which prevents the wear.

If a mineral excited by either rubbing or heat is presented to one of the balls it is attracted, no matter which kind of electricity has been developed. To distinguish between them the wire of the instrument must be electrified, and the character of the electricity must be known. Positive electricity is produced when glass is rubbed, from which fact it is sometimes called vitreous electricity, while any resinous substance produces negative electricity, which for that reason is sometimes called resinous electricity. Knowing these facts it is in the power of the mineralogist to charge his electrometer to suit his convenience.

To electrify the instrument it must first be insulated; this is done by placing it on a plate of glass, then place one finger on the base of the instrument, and holding a glass rod, or a stick of sealing wax in the other, rub the rod or wax briskly on a piece of woolen cloth, and place it near one of the balls without touching it; repeat this several times until the needle is sufficiently charged with the electric fluid. Then holding the rod as near the ball as possible without touching it, remove the finger and then the rod. As the instrument is insulated it will retain the electricity for some time. If you use a stick of sealing wax in charging the instrument, it is negative, if a glass rod, it is positive—suppose the former. If a mineral excited either by heat or friction is held near one of the balls, it will either attract or repel it. If it attracts, the mineral possesses positive electricity, as it has been shown that similarly electrified bodies repel each other. Should it repel, the mineral is negatively electric.

(To be Continued.)

In the Overman mine the pumps are hardly able to hold the water in check, and if the heavy flow continues at the present rate the erection of new and more powerful pumping machinery will be necessary beyond doubt.

Academy of Sciences.

The regular semi-monthly meeting of the California Academy of Sciences was held on Monday evening last, President Davidson in the chair. The President has been absent ever since he went to Japan on the Transit of Venus expedition, since which time he has been in India, Egypt and Europe. As will be seen by his remarks in another column, he intends giving a series of lectures on this subject, "Engineering in Connection with Irrigation, Railroads and Harbor Improvements."

The following new members were elected: H. S. Craven, C. A. Stetefeldt, Louis Janin, James D. Hague, C. B. Dorsey, W. A. Skidmore, Hamilton Smith, Jr., Alfred Post, W. H. Hall, J. S. Curtis, Howard Schuyler, Alfred Ford and Charles Barton Hill. These gentlemen, with the exception of Mr. Hill, are all mining or civil engineers, and they propose to form the engineering department of the Academy. This department will soon be in working order.

Dr. Stout, curator of ethnology, invited attention to the sarcophagus, procured in China with great trouble and great favor, used as a receptacle for the remains of the late Minister Avery. It is constructed of teak; its sides are three inches; length, seven feet and 11 inches; breadth, three feet and eight inches; depth, two feet and eight inches. It was an extraordinary structure, differing from anything made by the Indian, and would make a valuable addition to the ethnological department, as illustrating the remarkable sarcophagi of different nations. On motion of the Doctor, he was authorized to receive this sarcophagus, either as a donation or in trust, to be retained by the Academy until such time as the relatives of deceased may desire to place it in another mausoleum.

President Davidson presented some specimens of boomrangs taken from different tribes of California Indians. They in general were very similar to those in Australia, though some minor points of difference were noticeable.

Dr. Stout moved that a vote of welcome be tendered by the Academy to their returned President. The motion was applauded and unanimously carried, it being put by the Vice-President.

General Colton brought before the Academy a proposition from the C. P. R. R. Co., to borrow specimens from the Academy to enlarge the cabinet of this railroad company, intended for exhibition at the Centennial, under the supervision of Mr. Scapham. The particular specimens desired were those of the ethnological department. This proposition to authorize the Trustees to make the loan was opposed by several members, but prevailed by a decided majority.

Wm. J. Fisher tendered his resignation as librarian. Mr. Fisher, who was formerly naturalist on the *Tuscarora* expedition, has purchased the yacht *Harvest Queen*, and has fitted up for outside work. He leaves next week on a six months' collecting tour on the Lower California coast. He will make an extended trip in the gulf, and collect all the natural history specimens available. There is quite a demand in the Eastern States and Europe for specimens from this coast, and Mr. Fisher's experience in this line is such that he will no doubt make a profitable voyage. He has all suitable appliances, such as dredges, etc., for the proposed work.

After listening to the remarks of Professor Davidson concerning his trip, the Academy adjourned.

P. H. Scott, the efficient superintendent of the Kossuth, has resigned, and Captain Sam Curtis, one of the most thorough miners on the Comstock lode, has received the appointment of superintendent of the mine.

The railroad surveyors are still at work making preliminary surveys between Reading and the Sacramento ferry, and there seems to be no doubt but that the track will be extended north of Reading the coming summer.

New and rich silver discoveries are reported in Bradshaw and Walnut Creek districts, Arizona, and some San Francisco experts are examining the War Eagle mine with a view of purchasing.

A heavy force of men are now at work upon the Walla Walla and Columbia River railroad, ballasting, strengthening and leveling the road, and putting it in good condition for running in the spring.

The Jackson mine in Mohave county, Arizona, has been sold to a Boston company for \$30,000, one-half of which has already been paid.

The Mount Jackson mining company, near Guernville, will put improvements on their mine to the value of \$25,000 during the coming spring.

The Grass Valley Union says: Richard Penhall, who was hurt in the New York mine last Saturday, died Monday afternoon.

The Blue Gravel mine at Snaker Flat, worth \$300,000 to \$400,000, will be disposed of at sheriff sale on the 16th of March.

One million feet of lumber per month is buried in the Consolidated Virginia mine.

The Ione Valley Coal Beds.

A correspondent of the *Amador Dispatch* writing from Ione City says:

Very few people outside of Ione have any idea of the immense beds of coal that underlie Ione valley and the adjacent hills to the south. S. Hart & Co. have opened two mines in these beds—one in Buckeye valley and one a mile from Ione. These two mines are six miles apart. The Ione mine has supplied the flouring mill of Hall & Son with coal, exclusively, for a number of years. It also supplies the Newton copper mine with coal, which is only six miles east of here. Several private families are using it, as it is much cheaper than wood. The Oneida has just completed a contract with the above company for 1,000 tons—the contract for hauling has been let to Brandon & Miller, whose "land frigates," with hack-action attachments (pull-backs), are now moving up the grade daily.

Messrs. Hart & Goodman are making arrangements to put an engine and hoisting works in the Ione mine which, when completed, will enable them to take out from 5,000 to 10,000 tons of coal per month. The same amount can be taken from the Buckeye mine, as they are about equal in depth and working facilities. These mines are inexhaustible and capable of supplying Sacramento and San Francisco with fuel for the next hundred years. Just think of a royalty like this in the hands of two or three men, to say nothing of the thousands of acres of pasture, supporting as it now does 16,000 sheep the year round, besides numerous herds of cattle and horses. The land contiguous to the coal mines is well timbered and water easy of access.

The Gravel Mines on Irish Hill

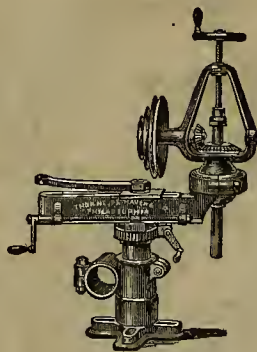
Are another prominent feature not to be overlooked while considering the industries and resources of this portion of the county. The Hooper ditch, lately completed, furnishes water sufficient to run six monitors (hydraulic pipes). These claims are also on land owned by S. Hart & Co., and are now being worked by them on an extensive scale, in company with A. Hayward, and one or two others, under the name of the "Ione hydraulic mining company." They employ 20 experienced miners and work three claims, with two monitors to a claim, running day and night, hattering with a constant and terrible force against a bank of gravel ranging from 20 to 50 feet in height. The noise of these hydraulic monsters is literally like the "sound of many waters." The gold is scattered through the gravel from top to bottom and in some places is very rich.

Appearances indicate a clean-up of \$10,000 per month over and above expenses.

Mining in Montana.

The *Montanian* says: There is every indication that the prospects of the mining interests of Montana are steadily improving, and that the coming years will be prolific in the development of this important industry. The apothegm that "the country is played out" is no longer the favorite utterance of the miner and prospector, but in its stead are heard the cheering reports of "strikes" and discoveries which give signs of promise. Fields which were once supposed to be valueless for mining purposes are now being prospected vigorously and in many cases with good results. The mining community have settled down to the work of discovery and development in a business-like manner, and the results of their persistent application to this pursuit are beginning to show themselves. The time is passed for the mere sinking of a hole to be called "prospecting;" the discovery of paying mines in places where hundreds of so-called "shafts" have been sunk has demonstrated the fact that such prospecting is labor thrown away, and the majority of those who engage in this business now enter upon it with a determination not to desist from their work until they are satisfied that the precious metal is not to be found in paying quantities in the locality which they have selected to work upon. It is true that "big" strikes are not reported with such frequency as in the days of '64 and '65, but the fact remains that an immense area of mineral land hitherto supposed of little worth is being opened up, which will yield a good percentage upon the capital invested and labor expended thereon. The business of mining is as any other business, and its prosecution must be carried on upon business principles, and the sooner every class of miners appreciate this truth, the sooner will their efforts be rewarded with success. We are glad to notice that in almost every section of the Territory there are indications of improvements. The placers are yielding well, and a good area of new ground will be worked or opened up during the coming season. The quartz interests are showing better than ever before, and it does not require a great exercise of prophetic faith to predict that the day is not distant when Montana will take a place in the front rank of bullion producing regions, and that those whose restless spirits urge them to abandon her for chimerical riches in other territories will have cause to regret their action. Those who adopt as their watchword the adage that "the rolling stone gathers no moss," will have abundant opportunity to laugh at the restless uomads whose faith is pinned to the proverb that the "setting hen lays no eggs."

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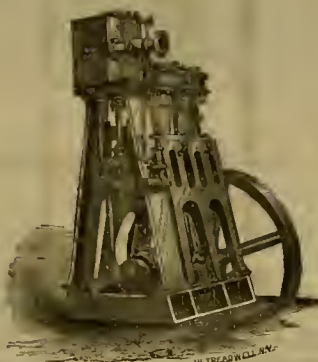
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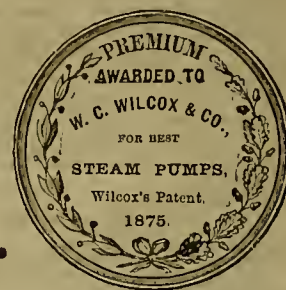
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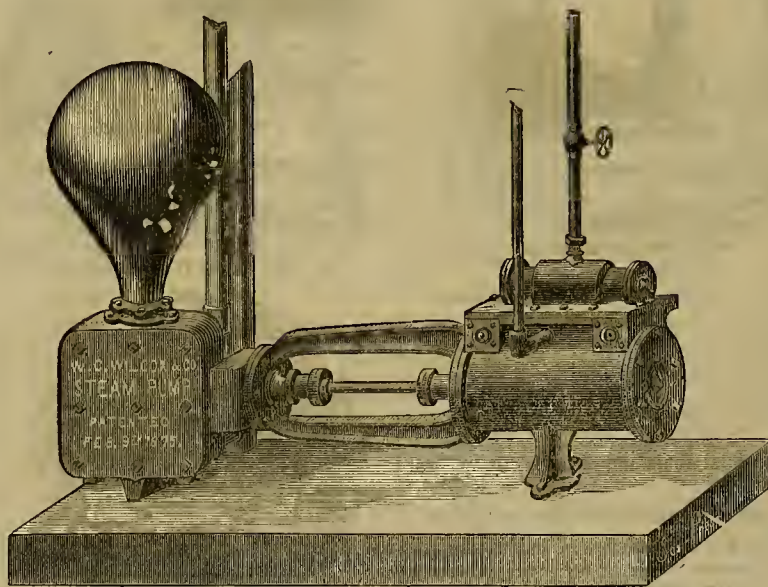
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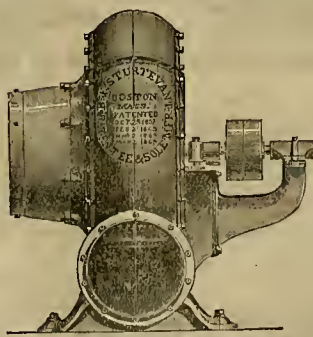
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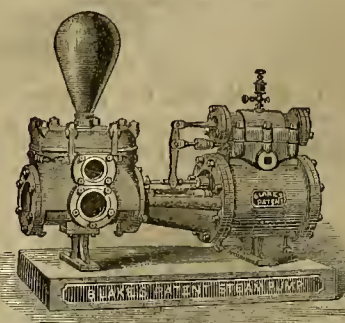
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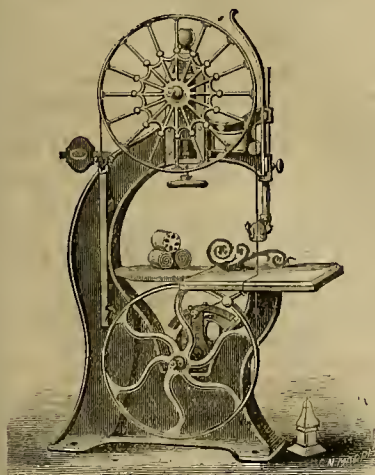
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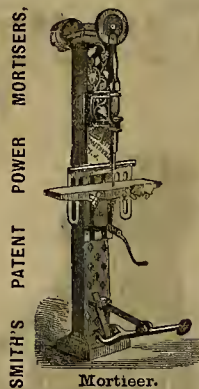
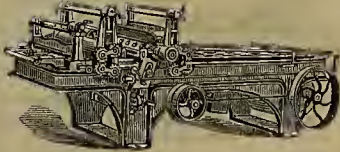
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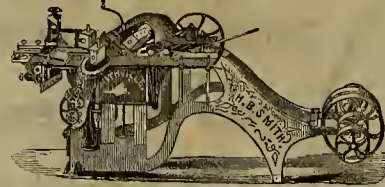
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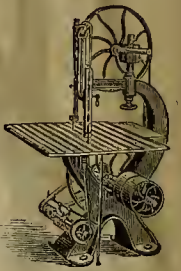
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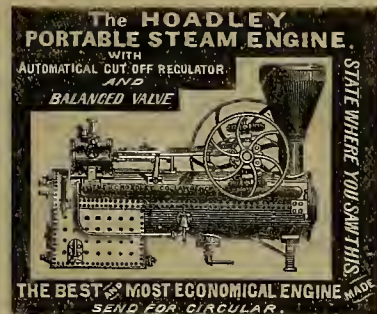
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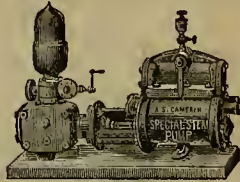
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MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO.,
Patent Solicitors.

SAN FRANCISCO, SATURDAY, MARCH 18, 1876.

VOLUME XXXII
Number 12.

The Foot Lathe.

The development of a taste for the mechanic arts has been very marked within a few years past. Students, clergymen, gentlemen of leisure, and others of sedentary habits, have sought relaxation from mental and physical strain in this, to them, agreeable recreation. That which to the mechanic is wearisome through its necessity, readily becomes a pleasant and, at the same time, useful pastime. Many of our most active business men have a workshop fitted up at their homes, in which some of the most costly tools are kept, where, after the vexations of a day's business, they can unbend their minds and relax their muscles in fashioning some tasty article as a gift to their family or friends. Such gifts are appreciated the more, both by the giver and by the recipient, for the reason that they are the result of hours of patient labor.

The most important of the tools required in developing this taste—in fact the first and only necessary one—is the turning lathe. By the use of proper appliances it can be adapted to an almost unlimited variety of uses. To turning articles of wood or iron of every conceivable shape, to drilling, to engraving, to sawing, and in fact to almost every description of work.

When the necessary motive power cannot be obtained elsewhere, the operator can supply it by means of foot power. The manufacturers of the Eagle foot lathe seek to supply with this implement a want long felt for a foot lathe of perfect construction. By devoting a manufactory exclusively to this work, supplied with expensive machinery and every convenience, such as in the system of the manufacture of fire arms, etc., the manufacturers, W. L. Chase & Co., of New York, have succeeded in producing, at a moderate price, foot lathes interchangeable in all their parts and of good style and finish.

We illustrate on this page three forms of the Eagle foot lathe, of which a number of sizes are made. Lathe No. 1 swings six inches and turns twenty-two inches long. This lathe is perfectly adapted for most kinds of turning in wood or metals, also drilling, boring, polishing, sawing, etc. The legs, bed, balance wheel, cone pulley, head and tail stocks and treads of this lathe are made of cast iron, and the spindles are cast steel. The spindles run in boxes which can be tightened up as they wear. The balance wheel weighs forty-two pounds and has three sizes for change of speed, and by varying the motion of the foot, will give a sufficient compass of speed for the size of the lathe. The hand rest, slide rest, and tail stock are held in place by cam fastenings. The running parts are truly balanced and noiseless. The lathe is very strong and free from any vibration, and combines strength and durability without being heavy or clumsy. This lathe is painted and varnished in plain but good style, and has a black walnut bracket shelf attached to the bed. The pieces which accompany it without extra expense, are two pointed centers, one spur center, face-plate turned and polished, three T-rests, one nine inches, one six inches, and one three inches long. The center in the tail stock is loosened when the spindle is drawn back far enough for the traversing screw to touch it. The ways of the bed are planed true, and are thirty-six inches long. The circular and gig saws which fit this lathe are simple and convenient. The treadle is provided with a joint to avoid injury to the feet, should they get under it while in motion.

Lathe No. 4 swings 10 inches diameter and turns, as ordinarily made, 31 inches, although the length of bed can be varied up to six feet to suit purchasers. This lathe is better adapted to larger and longer work than the others, and at the same time will do smaller work as well. The balance-wheel has three sizes for change of speed, giving efficient compass of motion by the variations of the foot. The engraving represents No. 4 back geared. The legs, bed, balance-wheel, cone-pulley, head and tail stock and treadle of this lathe are made of cast-iron. The spindles are made of cast-steel, with

hollow and conical hard-wood bearings, finished and polished. The ways of the bed are planed true, and are four, five or six feet long, as may be desired. The tail-stock is so constructed that it can be set over for taper turning or irregular pieces. The hand-rest and tail-stock are held in place by cam fastenings. The circular and gig saws are used on this lathe. The treadle has a joint to prevent injury to the feet, should they get under it. The crank-shaft of this lathe runs on steel points, making it easy running. This lathe is ornamentally designed, painted, varnished and finished in superior style. Brackets and shelf are attached to the back, or beneath the bed. The lathe is built both with single and back geared head-stock.



EAGLE FOOT LATHE NO. 1.

In addition to the lighter lathes, to be operated by foot-power, these manufacturers have arranged one similar in every respect to those in use in manufacturing establishments, having self-acting, feeding and screw cutting apparatus, back gear in the head for slow speeds, etc. The cut gives a fair representation of the style. Swings ten inches diameter, turns from 28 inches long to 40 inches long, according to length of bed; has hollow spindle, conical bearings, hardened steel boxes, and set over tail-stock for taper turning; cuts right and left hand threads of from four to 80 to the inch.

The manufacturers have a simple little device of great utility (which is readily attached to this lathe,) for cutting gears, from the smallest practical size up to nine inches diameter and one inch face. The belts used are Underhill's patent belts of a peculiar shape, to which cone pulleys are adapted. With these lathes a number of appliances increase their usefulness, and are made by the same manufacturers. The slide rests are provided with two slides placed at right angles with each other, carrying a tool which may be drawn back and forth or sideways by means of screws, allowing any position for the turning tool. It is worked by hand, and will turn straight or tapering, and faces or square up surfaces. In addition there are drills, drill-chucks, circular saw, gig saw, geared chucks, lathe dogs, drill collet, bit shank collet, drill pad, scroll saw, crotched center, back and center rest, etc. They also manufacture a hand planer as an auxiliary to the lathe. These tools are not by any means toy machines, but first-class implements, adapted to all variety of work. The agents in this city, Messrs. Dnnham, Carrigan & Co.,

No. 107 Front street, have a number of these machines on hand at their store, where they can be examined by those interested; or by addressing them a descriptive circular will be sent, which illustrates and describes the various styles. Those, however, who have the opportunity will see many things of interest in this line by visiting the store.

The State Geological Survey.

The Senate Committee on Finances on Wednesday night had under consideration the two bills, one by Graves and the other by Hendricks, for the completion of the Geological Survey. The bill by Graves appropriated



EAGLE LATHE NO. 4, BACK GEARED.

\$4,000 per month and looked toward carrying on the work much after the manner in which Professor Whitney proceeded with it. The bill by Senator Hendricks only appropriated \$8,000 per year and confines the operations under it to the sphere of economical geology. After a long consideration of the subject the Committee came to the conclusion that the present condition of the States' finances will not warrant any expenditure in this direction, and will therefore report against the passage of both bills.

This is much to be regretted, although the friends of the measure had only slight hopes that it would pass this session. The miners will be the greatest losers, as we feel confident that had Mr. Good-year, who had the best chance of being State Geologist, taken the matter in hand, under proper auspices, he would have published many facts of interest and value to the mining community. It is a great pity that a work like the State Geological Survey, on which so much money has already been spent, should remain incomplete for the want of a small appropriation to work up material already gathered.

The situation at Fort Pease, Montana, was, at last accounts, more desperate than ever. Between 2,000 and 3,000 hostile Sioux are constantly swarming throughout the country, preventing the garrison from venturing forth for game or even fuel, being even reduced to the extremity of burning their cabins inside the stockade to warm themselves and cook their food. Nine men, absent for some time up the Big Horn, had not been heard from, and it is feared that they have been murdered by the Sioux.

Mining Engineers at the Centennial.

The Centennial exhibition at Philadelphia will draw together, among other classes of persons, a great many mining engineers from various countries, and we are glad to see that the American Institute of Mining Engineers has taken steps to properly entertain those who come from abroad. The committee having in charge the reception of foreign mining engineers and metallurgists coming to this country to visit the Centennial, have secured rooms at No. 1,123 Girard street, Philadelphia, which will be open to guests and members of the Institute from April 1st to December 1st, 1876.

These rooms will be in charge of a secretary of the committee and employees, and will be furnished with all the technical periodicals, with conveniences for writing and parlors for meeting and conversation. An address book will be kept by the secretary for recording the names and addresses of the members of the Institute and of foreign engineers and metallurgists who come to the exposition. All members of the profession coming, introduced to the Institute or its members, will receive a card which will entitle them to all the privileges of the rooms and to attend and take part in the meetings of the Institute.

The annual meeting, which takes place in May, has been adjourned to the last of June, in order that they may have the pleasure of having the largest possible number of foreign engineers present. It will be held in the Jury Pavilion of the exposition.

The committee propose to give conveniences at the rooms for the storing and forwarding of baggage, specimens and packages which their guests may have collected in any part of the country and desire to have kept in a safe place until they are ready to take charge of them. They also propose to prepare schedules of information relating to the leading mining and metallurgical industries of the country. In case any one should desire to pursue a special line of enquiry the secretary or the members of the committee will take great pleasure in forwarding such investigation. It is designed also for those members of the profession who have but a short time to remain, to group for survey the special objects which they may have an interest in studying in the exposition. The secretary is instructed to furnish to those who desire to make the acquaintance of specialists in this country, letters of introduction, which will secure for them, not only admission to the works which they desire to visit, but also the acquaintance of technical gentlemen in all parts of the country. The Institute hopes in this way to furnish its foreign guests, not only with special information, but also to put them in the way of getting at a general survey of the whole of the mining and metallurgical industries of the United States.

The Committee consists of Eckley B. Coxa, J. S. Alexander, Thomas Eggleston and E. W. Raymond. They solicit from engineers and others on their coast and elsewhere, copies of proceedings, reports, maps, surveys, drawings of machinery, etc., to be placed on files in the rooms of the Institute. Contributions of this kind can be sent to the committee at the above address, or to any of the following named members of the Institute in this city: J. D. Hague, Henry Janin, Louis Janin, William Ashburner, and John H. Bealt; or W. S. Keyes, Eureka, Nevada.

THE PRESS AT THE CENTENNIAL.—We have received a circular, issued by G. P. Rowell & Co., describing a plan for exhibiting the serial publications of the country at the Centennial. A beautiful building will be erected, in which the thousands of magazine and papers will be shown. It is a happy idea, and many a visitor from far off regions will feel as though he had met an old friend as he sees his favorite newspaper spread its well known face before him. We heartily approve the plan. The Press will be there, ready to receive its patrons and friends in the elegant newspaper edifice.



SCREW CUTTING ENGINE LATHE.

CORRESPONDENCE.

West Mountain Mining District.

EDITORS PRESS:—As doubtless many of your readers are interested directly or indirectly in mining affairs in this part of Utah, I will give a concise statement of the situation. During the past winter many locations previously considered of doubtful value have been developed into first-class mines. Not first-class in comparison with the Consolidated Virginia, but otherwise truly first-class. Among the smelting ore mines, the Montreal has become as good as the best in the district; is producing 30 to 40 tons per day, with a capacity of 75 tons per day—worth about \$50 per ton on the dump. Ore mostly a greyish carbonate of lead.

The Nez Perce mine, in the same vicinity, is much the same in quantity and value.

The Sacramento, which had lain idle for six or eight years, has recently become a good producing mine.

The Decomposed is owned by some colored men, who had run a tunnel 300 feet directly away from their vein, and become about discouraged; at the advice of the writer they began back, and within 10 feet of the surface struck ore in large quantity, which has given a different cast to their countenances.

The Grecian Bend, which, a few months ago, looked as ridiculous as the ladies' fashion from which it derived its name, is becoming very promising in ore production. As many more, the names of which I cannot recall, within a few months past have become profitable. The older mines are retaining their good repute. In regard to milling ore veins, the discovery of which I wrote you in my last communication—the frequency of their discovery and their richness is creating considerable excitement.

The first of the kind found, the Mayflower, is being sunk upon, and is developed to the depth of 600 feet. The ore is mostly of rather a friable consistency, not much harder than chalk, and is worth in gold and silver about \$35 per ton. The vein is from five to 10 feet in width. The Accident, two miles from the former, last week struck a three-foot vein of ore, assaying from \$500 to \$900 per ton in silver and gold! Another in the same vicinity, at a depth of 40 feet, are on a four-foot vein assaying \$75 per ton.

Many discoveries of this kind have heretofore been made by persons looking for galena, and were regarded as of no account. Nearly all of these good finds were made by poor fellows who need assistance from the moneyed men. Although we are making great efforts to increase the supply of gold and silver, we see none of it after it is whirled away from us in the shape of bullion. It is too bad that we cannot handle and rattle it in our pockets after having provided it to be manufactured into the shiners. Greenbacks are becoming odious and odoriferous. Yours, WILLIAM TEAL, Bingham, March 2d.

The Black Hills.

The following letter of Mr. Silas Reed was recently published in the *St. Louis Globe*. He seems to have had some experience of the country, and gives a good idea of it in his letter:

I see so much said and written of late about the Black Hills of Northeast Wyoming that I feel inclined to jot down a few suggestions in regard to the rush of emigration there, which is now so fully inaugurated. I have spent the last six summers in the Rocky mountains, and have ascended every considerable mountain in Wyoming—and also many of Colorado, Utah and California—except where the presence of Indians forbade it.

The people of the great valley of the Mississippi have only the faintest conception of the splendid climate, the sublime scenery and the unlimited mineral wealth which exists there.

In my six annual reports to the Commissioner of the General Land Office, I have given a summary view of the geology and mineralogy of the mountains and plains visited, and may therefore state that I believe the mineral wealth of Wyoming will, when equally developed, show to be as great as that of Colorado.

The purpose of this note is to warn the young men of the country from rushing to the Black hills in too great numbers this spring, and without due preparation and thorough outfit for the work and hardships before them. The fear is that the gold-bearing surface within the Black hills is not large enough to repay the labors of the thousands and tens of thousands who are rushing thither this season.

A letter just received from a citizen of Cheyenne, who is well informed as to the numbers going, states that 15,000 men and miners will be in the Black hills before midsummer. This would not be too great a number, if it were not for the fact that these "hills" are literally in the center of the largest and most warlike tribes of Indians that roam over the great plains and mountains.

Red Cloud and Spotted Tail, with their bands, are located at the southern extremities of these hills, and the wild "haves" of other more warlike tribes flank the hills on the east and west and north, and will prevent the grazing of cattle and the cultivation of the soil around the borders of the gold region. Hence, nearly

all the supplies will have to be transported from Cheyenne, a distance of 200 to 250 miles, right past the camps of Red Cloud and Spotted Tail.

How easy it would be for these Indians to cut off or destroy the supply of food at any time, if so decided upon by them.

The real winter months do not end at the eastern base of the Rocky mountains until late in March and April. The cold is not so great, but there is more snow and wind. This will hold the Indians in check until about the 1st of May. After that, every man will need his Henry rifle and plenty of ammunition, and a quick, watchful eye and a brave heart to save his scalp.

These Indians are smarting for vengeance, because the United States Commission would not agree to pay them \$6,000,000 last fall for the hills. They will avenge their supposed grievances on the miners as soon as the new grass comes up, in May.

Gen. Crook is already moving, or about to move, a large army in the Indian country, along the eastern base of the Big Horn mountain, with scouting parties branching east towards the Black hills, and north toward the Yellowstone river. I was informed by Gen. Ord, when in this city a few days since, that the movements of Gen. Crook were doubtless intended as a restraint upon the Indians—a warning to them not to attack the mining camps, except they court war and that good whipping which the wild, fighting young men of the Sioux tribes will doubtless get before they live in peace with the miners and herders of that splendid valley bordering the Big Horn mountain and Yellowstone river.

All Wyoming and Montana rejoice at the certainty of a speedy occupation of gold mountains and rich grazing and agricultural valleys lying between Fort Laramie and Fetterman, at this end, and Bozeman and Helena, at the other. These territories will now very soon have a pathway "across lots," from Cheyenne, via Fetterman on the North Platte, the eastern base of the Big Horn mountain and up the valley of the Yellowstone to Bozeman mountain.

The distance from Cheyenne to Bozeman, on this line, is very little, if any, greater than from Bozeman to Corinne, on the Central Pacific railroad, nearly 600 miles west of Cheyenne. This road is a cut-off along one side of the great triangle which was attempted to be opened both by the Government and people in 1867-8, by the erection of expensive forts through the Indian country between the North Platte at Fort Fetterman, and the Big Horn river, near its confluence with the Yellowstone, at the crossing point of the former, where Fort Fetterman was erected.

Fort Phil. Kearney was located near the head of Tongue river, and Fort Reno on the headwaters of Powder river.

These streams both rise in the eastern slope of the Big Horn mountain, and bring down gold. The Montana miners are looting upon them.

The Indian massacre of about 80 soldiers, one morning in 1868, at Fort Phil. Kearney, caused the surrender of the United States Government to the Sioux Indians, and the abandonment of all three of the forts.

It was a fatal mistake toward the new settlers of those territories, but will now soon be remedied, through the presence of General Crook and the great army of miners now taking possession of that magnificent new country.

The future cities along this assured line of travel from Cheyenne to the Yellowstone, and thence to Bozeman, Montana, will be at or near the sites of the three abandoned forts, and at or near the mouth of Clark's fork, a gold-bearing stream which enters the Yellowstone from Wyoming, below the falls of the latter.

There is one great and gratifying fact connected with the present rush of miners to the Black hills. When too many collect there to work profitably the limited area of placer deposits they will find an ample and ready outfit by going west 75 to 100 miles to the Big Horn mountain, which has five times the gold-bearing surface the Black hills, and is a part of the main range of the Rocky mountains.

The Indians do not frequent that mountain in very large numbers, even in summer, and a reasonable force of miners would be far safer there than in the Black hills.

This mountain is crescent shaped, with its center cut through by the great canon of the Big Horn river, and its southeast point reaching to within 40 miles of old Fort Casper (well known to early California emigrants), on the North Platte, west of Fort Fetterman. Its southwest arm forms the mountain east of Yellowstone lake, giving rise to Clark's fork and other rich gold-bearing streams, and finally joins the great Wind River range (the main crest of the Rocky mountains), northwest of Fremont's peak.

The southeastern end of this Big Horn mountain is very safely and easily reached. The route is from Cheyenne to Fort Fetterman, thence up the North Platte along the old emigrant trail to old Fort Casper, and thence northwest 40 miles over a rolling, grassy country, to the headwaters of Powder river and the Big Horn mountain.

Were I a young man, and anxious to plant myself in the largest unoccupied gold field on this continent, I would enlist 100 brave, hardy, resolute and ambitious young men, from farms and workshops, to join me in the great work of opening up the gold and silver resources of the Big Horn mountains, and founding two or more cities equal to Denver in the early future, at their base.

Somebody will begin this great work very soon, now that General Crook is on hand with his protective force to see that the miner, unmolested, unlocks the great treasure hoard there, and is not driven away by his own Government, as has been the policy heretofore.

The Wind River valley, on the west side of this mountain, is the home of the friendly Shoshone Indians, where fine wheat and other cereals are raised, and can be had in great abundance.

These Indians would hail with great joy the advent of white settlers in this valley (see farmers) and miners in the Big Horn mountain, as that would re-inforce them against their enemies, the Sioux, on the east side, toward the Black hills.

A narrow-gauge railroad on this route has been discussed by men of Wyoming and Montana for several years, and is certain to be built from Cheyenne, via Fort Fetterman, to the Yellowstone, as soon as the Indians are overawed. It should be commenced immediately. Not a month should be lost in hesitation by the men of Wyoming and Montana.

Mining Affairs in Idaho.

From a recent number of the *Owyhee Avalanche* (Idaho), we take the following, which will give an idea of the mining situation on War Eagle mountain:

To the eye of a casual observer the status of affairs on War Eagle mountain at the present time does not reveal a very encouraging picture, although the ups and downs of mining camps present their bright and dark reflections at intervals, and it is possible that we are just now passing through the ordeal known as "the dark hour before the dawn," and having got down to bedrock an ascent of the up grade may give us opportunities to retrieve the errors of the past and lay a better foundation than ever for future operations. It is meet that we should take in sail and keep close to shore. The old residents of Owyhee have passed through some trying ordeals in the past, and although the prospects at present are not as bright as they might be they are not entirely discouraged at the outlook. It is not an encouraging sight that is presented to the eye on wandering over War Eagle mountain to see such costly mining works as the Mahogany, Illinois Central, Oro Fino, Red Jacket, Silver Cord and War Eagle, erected at an expense of several hundred thousand dollars, lying idle and unproductive when it is conceded that under judicious management all these mines might be turning out hullion and yielding handsome dividends to their owners.

Will the men who have invested so much capital here in aiding to develop the mines allow these valuable works to go to ruin? We believe not. It is not for their interest to do so. The curse of the camp may almost be summed up in one word—mismanagement. Take for instance such a mine as the Illinois Central, which two or three years ago was managed by a gentleman who kept a moderate force of men at work and so conducted operations as to make the mine yield dividends for its owners instead of assessments being the rule. Every man who knows anything about such a mine as this knows that it can be taken hold of again and worked successfully. Extravagance, irresponsible management, unnecessarily expensive works, employing a much larger number of hands than can be judiciously worked, have all combined with other causes to bring about the present state of things. The mines have not been worked on their merits. They have in many instances been used as a cat's paw to further the interests of stock gamblers, and worthless dunghills of superintendents have been forced upon us and made to connive at rascality perpetrated in one form or another. The miner has been defrauded of his hard earnings. The mechanic has suffered, and every merchant and business man in camp has been made to feel the disastrous effects of such a ruinous policy. At "both ends of the line" this loose and dishonest system of managing the business has received more or less encouragement and people here have submitted to the outrage and had their rights trampled upon until "forbearance has ceased to be a virtue." We still have faith in the merits of the camp, but a "new deal" is called for at the present time. Give us practical, efficient and honest men to control the mines and all will be well. There is not a mine to-day on War Eagle mountain that under an economical and judicious system of working could not be made to do a profitable business, and now that we are about down to bedrock it behooves every man interested to use all the personal influence that he possesses in the way of securing such an honest and efficient management as will cause all to feel that the resumption of operations under different auspices shall have a brighter outlook in the future than we have been accustomed to speculate upon in the past.

A RICH STOCK BOARD.—The San Francisco Stock and Exchange Board, better known as the "old board," have declared a dividend of \$200 per certificate, payable immediately to each of its 100 members. The total amount to \$20,000. The resource of the "old board" have swelled to quite a respectable figure. It is officially stated that the building fund, \$300,000 coin, is in hand. The lot upon which the building is being erected is already paid for (\$150,000), and there is left beside \$200,000 in the hands of the Treasurer. The income from receipts is \$30,000 per month, enough to pay a monthly dividend of \$20,000 and carry over \$10,000 monthly. A seat in this board is now valued at \$30,000.

A New District—Aurora.

A correspondent of the *Silver State*, writing from Cornucopia, gives the following about Aurora, a new mining district in Nevada:

This district is located west of here, and near the Winnemucca and Cornucopia road. It was first noted by a sheep herder in 1871; but locations were not made, the sheep herder thinking there was nothing in it. W. B. Vanx, an old prospector, well known in Caribon, Idaho, Montana, and the discoverer of the celebrated Rabbit Creek district, in the Salmon river country, Idaho, and one of the party of five that traveled 500 miles on snow shoes in the dead of winter from the head of Salmon river to the head of Cedar creek, and the lucky discoverer of the Last Chance mine on Quartz creek, on the Missoula river, in the same district, discovered this new district of Aurora.

In May, 1875, some parties claim they knew all about it; but it is all false. Nothing was known about it until Vanx & Co. prospected it this last summer, fell and winter, and brought it into notoriety. Billy Vanx and Bob Hutchinson are indomitable; two of the best prospectors in the country. They have formed a new district and called it "Aurora," adopted mining laws according to law and acts of Congress of the United States. They have located, first, the Aurora, croppings of which assay \$201 per ton, assessment work all done; then the Pride of the West, four assays as follows from the croppings, \$1,007, \$1,012, \$750, \$2,000; next, the Savage, a well defined ledge, no assay yet made, but a splendid prospect is shown; next, the Washington, the float assays \$500 per ton; this is a very large ledge—face simile of the Leopard; next, the Florence comes, this is similar to the Washington, which it joins on the south; then comes the New El Dorado, a splendid ledge, and the same character as the Washington, can be traced for a mile and a half, and runs directly towards Cornucopia, and is in the same belt or porphyry range, is 18 feet wide on top; then we see the John Adams, which joins the Washington extension, a well defined ledge; then the Thomas Jefferson, a well defined ledge, blind at first, but it shows good ore of a chloride character, and would astonish the old chloriders of Mountain City and Cornucopia in their palmy days. Thus, Mr. Editor, from the sources from which I glean information I must say that Aurora stands at the head of the heap. The boys say they will ship considerable of their croppings to the Humboldt reduction works, and then they think they can make it pay.

Build the road, make it passable, and you can bet that the northern portion of Elko county will look to Winnemucca as its objective point on the railroad. Build the bridge and the miners of Aurora intend to give freight teams all the ore they can carry to be worked at Winnemucca.

Copper in the Foothills.

All old settlers remember, some with pleasure and many with sorrow, the great copper excitement that existed in the foothill region from Mariposa to Tehama, some years ago. The excitement was occasioned by the discovery of numerous ledges of rich copper ore. But when the second discovery was made that this copper ore could not be made to pay with the facilities at hand for working it, the excitement suddenly died away. Many, though, asserted then that in time, when improved appliances for reducing the ore could be had near at hand, instead of in far off Wales, the nearest then, these mines would become remunerative. That time, it seems, is about upon us. Successful reduction works have been erected in different localities, and, as a consequence, the interest in copper, from Conneropolis to Spenceville, along the foothills, is fast increasing. Spenceville lies in Nevada county, just across Bear river, which divides that county from Placer. A correspondent, writing from there to the *Marysville Appeal*, under date of February 21st, on this subject, says: "I hope you will give me room to inform the readers of your paper in regard to the copper mines in Spenceville and vicinity. Of the San Francisco company, whose works are located in Spenceville, and under the management of Mr. Aaron, great hopes are entertained in their success. The company expect to be shipping copper in about one month. Their ore is worth seven per cent., and they have 2,000 tons out and already roasted, which they intend to put through the leaching process as fast as their works will allow them. The Centennial works, located near Hacktville, are owned by Cantfield & Bitoer; the works are under the management of Mr. Cantfield, who is a man of great ability and a scientific copper miner. His process is beyond a doubt a success. It is new and known only by him. The Green and Western Star will be opened in the spring; their ore will go 10 per cent. The Last Chance mine is the richest one in the district, and its ore goes from 15 to 30 per cent. This mine is owned by San Francisco capitalists. The company intend to open their mine in the spring. There are hundreds of good mines in this district that some day will be opened. All that is wanted to make this the best mining district in the State is capital.

The California and Brunswick mills will soon be started on ore from the California mine. These two mills alone, running on the rich ore of the mine, are expected to be amply sufficient to make steady dividends, the California mill alone having crushed 8,000 tons of Consolidated Virginia ore during the month of February.

SCIENTIFIC PROGRESS.

The Practical Uses of Light.

Dr. Crookes appears indefatigable in his endeavors to turn his recent discovery of the motive power of light to some practical advantage. He recently read a paper before the London Institution on the "The Radiation of Light," in which he alluded to some possible practical uses to which his discovery might be applied. He suggested that the torsion balance, which he has used for testing the amount of action caused by the approach of light to it, should be employed as a test for the purity of our gas supply. First he would test the quality of the standard candles used, which it is known really vary very much when that variation is regarded from the standpoint of scientific accuracy. Then, with the torsion balance, he would test the comparison between the gas and the standard candle, the slightest motion of the balance being capable of being recorded by the index scale on which the reflecting mirror shines. The other suggestion was the application of the rotating apparatus to meteorological purposes. He has arranged the windmill rotating wires with pith balls, so that they carry round a small magnet suspended beneath them. Their rate of rotation depends on the amount of light that falls on them.

Near the magnet attached to them is suspended another magnet, which oscillates as the attached magnet presents alternately its north and south poles. This oscillation is arranged to make and break an electric circuit, which, by a wire that may be of any length, is connected with a recording Morse machine worked by clock work. Each revolution of the rotating pith balls is thus recorded by a pen of the Morse on a strip of continuous paper, and so a self recording account of the amount of light falling at any place may be kept.

In our present meteorological records, Dr. Crookes observes, we notice heat, rain, and pressure of atmosphere; but light, the most important influence, both as regards health and agriculture, is neglected, because not till now have means of measuring it been known.

THE ABSORPTION OF HYDROGEN.—The well known French chemist, M. Gaillardet, has continued his researches into the absorption of hydrogen by iron, with some interesting results. It appears that when an iron plate is attacked by sulphuric acid being poured over it, a portion of the hydrogen produced is absorbed by the metal, and the pressure of the gas which is accumulated between two iron plates, welded together, is sufficient to counterbalance a column of mercury 13½ inches high. This singular property of hydrogen, which has also been confirmed lately by the investigations of M. Sevois, is regarded by the latter as a most interesting discovery, and he attributes to the presence of carbonic oxide, or hydrogenized gas, the brittleness which some classes of iron manifest when an attempt is made to draw them into wire, a fact well known to workers in this metal. It is also found that when decomposing by the galvanic battery a solution of chloride of iron to which sal-ammoniac has been added, metallic iron may be collected at the south pole in the form of a brilliant wart, brittle and often hard enough to scratch glass. This iron after being washed evolves, either under water or another liquid, numerous bubbles of gas, which is pure hydrogen. When freely exposed to the air, galvanic iron loses only a portion of its hydrogen; under water, especially water heated to 140 or 150 deg., the hydrogen is given off with violence. As to the quantity of hydrogen iron thus treated can take up, it seems that, for one volume of iron, the amount is 200 volumes of gas; in weight, 13 parts of iron absorb one part of gas. When a lighted match is applied to this iron saturated with hydrogen the gas burns like alcohol.

SCIENTIFIC BALLOONING.—In our enumeration, last week, of the practical and scientific benefits derived from ballooning, we overlooked one very important and very remarkable discovery, due to Gay-Lussac, in regard to the continued increase of electric tension as we ascend into the upper regions of the atmosphere. The air there has been found to be much more highly charged with positive electricity than that near the earth. The distinguished scientist named found that the increase of tension was in proportion to the elevation; hence, it was inferred that he was far from obtaining the maximum of tension. His observations indicate that we may consider the globe as enveloped, at great heights, with a vast, strongly electrified mantle, which is in constant motion from the equator towards the poles. In its passage thitherward, the electricity is constantly being drawn off, in small quantity, by the incidental action of storms (which largely derive their electricity from this source), the balance reaching the earth through the silent and mysterious medium of the aurora borealis.

In a drop of water obtained from a single snow-flake and magnified 500 times were found pieces of coal, fragments of cloth, grains of starch, sandy matter and an immense variety of other substances, not a fragment of which exceeded the three-thousandth part of an inch in diameter.

An Ice Rink at All Seasons.

A dangerous rival to the asphalt skating rink is announced. The wheel-skates are, after all, only an alternative. Locomotion on them is neither so free nor so pleasant as with an iron blade upon ice; and we are now informed that after five or six years of experimenting in Chelsea, Professor Gamgee has at last got at the secret of making an artificial ice sheet, capable of being maintained in perfect condition for skating from one year's end to the other. A similar plan has been patented, and is about to be put into practical operation in Glasgow, the object, as described in the patent specification, being to refrigerate and cool floors so that water carried thereon may be frozen with an even surface for skating and curling. Similar experiments to those of Mr. Gamgee have been carried on at the ice works at Garnethill, Glasgow, by their manager, Mr. Rae, who is one of the patentees of the invention referred to, and at the works of Messrs. Seddley & Co., Liverpool, and there is said to be no possibility of failure. The process is the same as that used in the manufacture of ice for dietetic purposes. It is very simple. A mixture of salt and water, cooled with ether in refrigerators, is made to pass between iron plates about half an inch apart. The upper plate is covered with a thin layer of water, which soon freezes and forms a dry, keen skating surface. At the rink which it is proposed to establish in the fashionable quarter of Glasgow, a new sheet of ice will be formed every morning; but if in the course of the day it becomes rough, all that is necessary is to sweep off the powdered ice, flush the rink with water, and in 20 minutes a new surface, fresh, firm and glassy, will be produced. This surface will also be more elastic than asphalt, and consequently less dangerous in case of a fall, and there will be neither dust nor sloppiness. It is not expected that the temperature of the ball will be much affected by the ice, but it is alleged that, if necessary, it may be warmed in the usual way without detracting from the efficiency of the rink.

Occluded Hydrogen in Explosive Antimony.

When chloride of antimony, made according to the directions of the German pharmacopoeia, is decomposed by a single cell of a Bunsen battery with a resistance of about 800 feet of copper wire (the positive electrode being formed of a massive piece of cast antimony, and the negative electrode of one or more fine platinum wires), in three or four days the platinum wires will be covered with a metallic film with a silver luster. The slightest scratch, or a spark from an induction machine, will cause it to explode with a loud noise and flash, and the evolution of a great quantity of white vapors. This was first observed by Gore, and it was supposed that the film consisted entirely of pure antimony in a peculiar allotropic state. Some years ago Professor Bottger proved experimentally that the apparently metallic film on the platinum wire did not, by any means, consist of pure antimony, but beside antimony there was in it no inconsiderable quantity of chloride of antimony, which could be proven by throwing a little distilled water on the disrupted mass while glowing; a copious white precipitate of basic chloride of antimony was formed, which could not occur if the said film consisted only of metallic antimony.

The most recent observation of Professor Bottger on this remarkable electrolytic product is the discovery therein of occluded hydrogen, possessed of the same reducing properties as that contained in Graham's alloy of palladium and hydrogenium. If a platinum wire, freshly coated with the so-called explosive antimony, is placed for 10 or 15 minutes in a very white aqueous solution of ferrocyanide of potassium, the latter will be partially converted into ferrocyanide of potassium, a property which chemically pure antimony, free from arsenic, does not possess.—*Sci. American.*

ANNUAL VARIATIONS OF TEMPERATURE.—Prof. Loomis and other authorities assert that although the annual mean temperature of a place varies, the difference between the coldest and the hottest year seldom exceeds 10 degrees, and this statement is supported by the following evidence:—"At New Haven the hottest year which has occurred in a period of 86 years was that of 1828, and the coldest year was that of 1836, the extreme range of the annual temperature in 86 years being 6.30 deg." The meteorological registers kept by President Day and Stiles and by Dr. Monson and others for the 86 years between 1778 and 1865 were rigidly inspected and reduced by a committee of the Connecticut academy, who reported these records as proving the following facts: "That for all those years of the century no permanent change had occurred in the average date of occurrence of the last frost of spring or of the first frost of autumn, nor in the time of the first snow of winter, or the last snow of winter, or in the average date of the flowering of fruit trees, such as the peach, cherry, etc." This was not inconsistent with the reports in the same records of great extremes of heat and cold temporarily experienced at intervals. Such extremes are well known in authentic history all the way up the Christian era.

"The Mass of Mars" is the subject of an investigation by Prof. Asaph Hall, of Washington.

SUNLIGHT ON FLORAL DEVELOPMENT.—In a German periodical on botanical biology, Dr. A. B. Frank has a paper on one-sided acceleration of the flowering of some catkin-like plants, showing that this is due to the action of light on the sunny side. In this respect American investigators are ahead. Some years ago a paper on this subject appeared in the proceedings of the Academy of Natural Sciences of Philadelphia on the same subject and making the same explanation. The catkins of some willows were shown to have their stamens develop first on the sunny side; and this growth toward the sun had the effect of giving the apex of the catkin an inclination toward the north. The American observer went further than the German one, and included the flowers of the early-blooming magnolias. These also grow most rapidly on the sunny side.

ELECTRICITY AND LIGHT.—A new relation between electricity and light has been announced by Dr. Kerr, of Glasgow, who finds that when glass, which in its normal condition is a singly refracting medium, is properly subjected to the action of intense electrostatic force, it assumes a new molecular structure and thus acquires the property of double refraction. A Ruhmkorff's induction apparatus was employed and a block of plate glass served as the dielectric medium, while polarized light was transmitted through the glass in a direction perpendicular to the lines of electric force. Under these conditions the glass acts as though it has suffered compression along the lines of force, or, in other words, it becomes a negative uniaxial medium. Similar results were obtained with other dielectrics, the action of resin, however, being contrary to that of glass, or positive.

MECHANICAL PROGRESS.

Sixty-Foot Rails.

We mentioned a few weeks since the fact that a few 60-foot rails had been rolled as a matter of curiosity, and to show the possibility of the production of rails of such great length. Since that time the Edgar Thomson steel works (Pennsylvania and New York) have recently been rolling 60 foot rails to order, which has called out considerable discussion as to their superiority over the ordinary 30 foot rail. The arguments in their favor are that they cost no more per pound than the 30-foot, and may be made for less, while two drop ends are saved. This is an item of no small moment. How to use drop ends economically is one of the serious problems at Bessemer steel works. Two 30-foot rails, of course, give four drops, and a 60-foot but two, which at once takes out of the question 50 per cent. of the difficulty. With a view to this cheapening of production by reducing waste the above works were designed to make 60-foot rails.

The saving in their use by railroads is not so evident, but it would doubtless be found more economical to use the longer rail. The cost of laying them will be less, and the wear and tear of rolling stock as well as the rails themselves will be much lessened. A larger part of the wear and tear is due to the "hammering" caused by the shock in passing from one rail to another, and on a track with 60-foot rails the number of joints will be lessened one half.

Some of the 60-foot rails ordered have been for laying on bridges, on the supposition that reducing the number of joints will reduce the strain on the parts of the bridge.

What the effect of expansion upon a track laid with these longer rails will be has to be seen. Of course, with only half as many joints the distance between the rails allowed for expansion and contraction will have to be greater, but in arranging the track for hot and cold weather only half as many joints will have to be attended to.

IRON VESSELS.—The steamer *Great Britain* was one of the first made iron vessels, and among the earliest to ply regularly between New York and Liverpool. She has lately arrived at the latter port from Melbourne, Australia, thus completing her 36th trip round the world. She was designed by Brunel, and built at Bristol. Her dimensions are: length (extreme), 330 feet; breadth, 57 feet; depth, 32 feet; with engines of 500 nominal horse-power. Since 1852, independent of her employment in the Crimea during 1854 and 1855, she has sailed over 1,000,000 nautical miles, her last voyage out from Gravesend to Melbourne only occupying 54 days, and when recently surveyed, she was pronounced to be one of the strongest vessels in the mercantile marine.

ELECTRIC LIGHT FOR LOCOMOTIVES.—Experiments with the electric light as a head light for locomotives, have recently been made in Russia, on the railroad from Moscow to Kursk, with successful results. The apparatus consisted of a battery of 48 couples, which produced sufficient illumination to light up the truck for a distance of 1,500 to 1,800 feet ahead. Instead of a battery, however, we presume it will be found much more easy and satisfactory to use a magneto-electric machine driven by the engine itself.

Nor only is certain hardware of American make sold in Australia, but American tool steel also, and is spoken of with favor. English steel has long had that field to itself, and if we are to have our steel sent there by invitation of preference, won't Bull stamp and paw?

Propeller Screws in Casings.

Mr. Griffiths, whose experiments with H. M. S. *Brusier* have attracted much attention, has been making some further trials with models at the swimming bath of the Greenwich hospital schools. The results which he has obtained from these latter trials are somewhat remarkable. Taking two models, representing the type of the long narrow and the short broad ship, both of the same displacement, and being respectively five inches long by seven and a half inches beam, and three feet one and a half inches long by 14 inches beam, Mr. Griffiths showed, by towing them at the ends of a cross beam, that the resistance of the water on the long one was to that on the short one as three to five. On putting a pair of twin screws in the ordinary position at the stern of the long ship, and driving them for 60 seconds by means of a piece of clockwork machinery, the model was propelled through the space of 55 feet. The short vessel, however, with the screws in the same position, was only propelled, with the same machinery, through the space of 28 feet in 60 seconds; but when the screws were placed inside tunnel casings with lip orifices, the model was propelled through a space of 62 feet, being, as will be seen, greater than that traversed by the long model when propelled in the ordinary manner. It was also found that, even when the screws were placed in the ordinary position in the short model, but the tunnels left open in front of them, a better speed was obtained than when the tunnels were closed, though not so good as when the screws were actually in the casings. The *Engineer* states that these results were considered of so much value by a gentleman representing the Imperial Russian government, who was present at the trials, that, at his suggestion, Mr. Griffiths has undertaken to have a model of a circular iron-clad made, and to conduct some trials therewith as to the difference of speed to be obtained by his system over that now used in the *Popoffka*, the circular iron clad.

A DOMESTIC STEAM ENGINE.—M. Riser, of Paris, has patented a portable steam engine, adapted for all sorts of purposes—hand turning, watch-making, machine sewing, stamping, hand sewing, etc. The boiler of this machine consists of two concentric cylinders of iron plate, the inner lining containing a serpentine of sheet metal with a furnace beneath, while the space between the cylinders forms a steam chamber. A feed cistern surrounds the fire, so that the water heat is utilized in raising the temperature of the feed water. A spherical metal case incloses the safety valve and steam port. These engines are made in various sizes, from ½ to 2-horse power. One of this principle, having ½-horse power, was recently exhibited in the Maritime exhibition. The generator of that was 2 feet high and 14 inches in diameter, and by an ingenious disposition the serpentine presents a heating surface of nearly 9 feet square, so that steam can be raised for working in about 12 minutes after lighting the fire. The coke consumed in working this engine is said to cost only one-half penny per hour, and the engine has a capability of driving a sewing machine as well as a circular saw 15 inches in diameter.

NARROW GAUGE RAILROADS.—An enterprising Bostonian, who has practically given his life to the study of railroading, and who has examined nearly all the roads in this country and in Europe, has recently concluded a series of experiments in narrow gauge railroad building, the results of which, he holds, are destined to create a revolution in the construction of railroads. He claims to have demonstrated that a road with a gauge of 20 or 24 inches is all sufficient for railroad purposes, and that the practicability of introducing excessively narrow gauge routes in places where common railroads cannot be built at all, or could not be operated at all, is beyond dispute. He estimates that by his plan a road can be built and equipped with rolling stock for \$5,000 a mile, and by winding round hills can be made to reach even to the highest settlements in the mountains. As connecting links from isolated towns to lines of existing railways they will prove of great benefit; and in the West, especially, where towns are widely separated, a railroad that could be built and equipped so cheaply could not fail to be universally adopted.

A NEW MODE OF GAS MANUFACTURE.—The *Gas Light Journal* records the following: An invention has just been made by Mr. John Mather, of Gateshead, by which atmospheric air rushing through a jet produces a vacuum in a small chamber or generator, into which also opens a jet from a vertical tube descending into a cistern containing a carboniferous fluid. This vacuum causes the fluid to ascend the tube, and to issue from the jet in a spray, which combines with the air rushing by. This combination is carried along a tube that passes through a furnace or oven, and finally conveyed in a gaseous state to the hydraulic main, and thence to store tanks.

A NEW LOCOMOTIVE.—A new locomotive has been recently completed in Philadelphia, under the direction of Mr. Weston, of Manchester, England, for the Pennsylvania railroad. It is claimed to possess greater power and to run at less expense than any other engine, as it utilizes both smoke and steam, and that it will draw a heavily-loaded train of 100 cars and can be stopped within its own length. The cab is on top of the boiler and the smoke stack is the size of a common stovepipe.

MINING SHAREHOLDERS' DIRECTORY.

480	Julia	16	16	101	Jefferson	3	3
489	Kentnott	17	17	102	Jackson	2	2
490	Lady Bryan	34	34	157	K K Con	1	1
2855	Mexican	33	33	50	Knickerbocker	4	4
94	do	b	30	158	Knickerbocker	4	4
1843	Ophir	65	65	835	Leopard	2	2
90	do	b	30	63	Lady Wash	4	4
100	do	b	5	530	Leo	1	1
1785	Sierra Nevada	23	23	20	do	b	10
100	do	b	5	110	Meadow Valley	2	2
985	do	b	1	50	Metallic	1	1
1775	Union	11	11	100	Northern Belle	1	1
255	Yellow Jacket	11	11	100	New Coso	1	1
AFTERNOON SESSION.				180	Occidental	1	1
390	Advance	9	9	300	Panther	12	12
1160	Aps	53	53	890	Poorman	2	2
20	do	3	3	20	do	75	75
30	Balding Star	4	4	300	Phil Sheridan	1	1
50	do	b	10	120	Ray & Ely	1	1
30	Baltimore Con	1	1	120	Rock Island	1	1
50	do	b	10	20	do	5	5
100	Coso Con	40	40	435	Silver Hill	11	11
1200	Cosmoopolitan	25	25	800	Secaledonia	2	2
120	Challenge	1	1	10	Tybo	1	1
10	Chollas	1	1	130	Tybo	5	5
490	Dayton	73	73	115	Utah	1	1
115	Eureka Con	134	134	550	Woodville	3	3
530	Euclid Star	1	1	WEDN'SDAY A.M., MAR. 9.			
225	Thomas Con	1	1	435	Alpha	42	42
1845	Gila	13	13	435	Best & Belcher	53	53
100	Husney	81	81	275	Belcher	35	35
910	Jefferson	3	3	400	Caledonia	8	8
30	Knicker	4	4	500	Chollas	1	1
1755	Koseuth	40	40	1730	Con Virginia	42	42
10	do	1	1	2907	California	8	8
750	Leo	1	1	420	Crown Point	25	25
75	Leviathan	1	1	255	Chollar	13	13
100	do	1	1	535	Conchance	1	1
60	Mint	5	5	420	Crown Point	25	25
100	Maryland	1	1	255	Empire Hill	1	1
100	Meadow Valley	64	64	435	Gould & Curry	21	21
170	New Coso	5	5	100	do	b	5
545	New York	1	1	220	do	b	5
535	Nth Carbon	1	1	100	do	b	5
100	do	1	1	150	Imperial	13	13
100	N Monumental	1	1	600	Julia	16	16
100	Occidental	1	1	10	do	b	16
100	do	1	1	300	Knickerbocker	16	16
140	Poorman	3	3	305	Lady Bryan	3	3
50	Picton	15	15	530	do	b	5
750	Pacific	1	1	530	do	b	5
100	Poorman	1	1	325	do	b	5
160	Ray & Ely	19	19	1200	Mexican	32	32
620	Rock Island	4	4	930	Ophir	6	6
20	St Patrick	1	1	855	Union	5	5
100	do	21	21	400	do	b	5
300	South Charlot	4	4	495	Savage	15	15
400	S Justice	2	2	100	do	b	5
700	Silver Hill	13	13	1400	Sierra Nevada	24	24
225	Tybo	1	1	1	Seg Belcher	1	1
150	Trojan	16	16	850	Succor	1	1
100	do	1	1	300	do	1	1
100	do	1	1	50	do	b	5
5675	Vivian	2	2	125	do	b	15
1015	Woodville	3	3	120	Yellow Jacket	11	11
750	Yellow Fargo	1	1	AFTERNOON SESSION.			

Compiled every Thursday from Advertisements in the Mining and Scientific Press and other S. F. Journals.]

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.									
Alameda Coal M Co	Cal	1	100	Feb 2	Mar 15	Mar 31	R F Budge	499 Battery st	
Antilles N M Co	Cal	2	20	Jan 24	Mar 11	Mar 27	H M Morgan	113 Leidesdorff st	
California Watch Co	Alameda Co	Cal	1	50	Mar 1	Mar 15	W C Sater	195 Sater st	
Commonwealth Beneficent Co	S F	1	50	Jan 28	Mar 1	Mar 20	O O Miller	320 Sansome st	
Cornucopia Cons M Co	Nav	1	10	Mar 13	Apr 17	May 8	F Swift	419 California st	
East Branch M Co	Plumas Co	Cal	4	25	Jan 24	Apr 6	A Martin	621 Sansome st	
East Yellow Jacket M Co	Washoe	Cal	5	13	Mar 13	P May 10	P Turner	Hall's Bldg	
Edwards W & M Co	Cal	13	200	Feb 3	Mar 13	Mar 27	H Montgomery	427 Montgomery st	
Electric M Co	Cal	8	5	Feb 4	Mar 9	Mar 25	A B Paul	318 Caifornia st	
Eureka Stone Manufacturing Co	S F	3	10	Jan 26	Mar 1	Mar 22	D Mowell	567 Market st	
Excelsior Quicksilver M Co	Cal	4	5	Feb 23	Mar 24	Apr 13	A Halsey	200 Sansome st	
Federal M Co	Washoe	Cal	1	190	Feb 15	Mar 15	H Thomas	381 Eddy st	
Frasno Quicksilver M Co	Cal	3	15	Feb 29	Apr 7	Apr 28	R Wegener	414 California st	
Genova Cons M Co	Neu	20	20	Mar 4	Apr 10	May 1	J T Milliken	302 Montgomery st	
Golden Suss G M Co	Butte Co	Cal	1	25	Mar 1	Apr 4	J Pentecost	712 Market st	
International G M Co	Cal	2	10	Feb 3	Mar 2	Mar 28	M C Livingston	312 Montgomery st	
Int'l M Co	Utah	Cal	3	30	Feb 15	Mar 21	Apr 18	F Maske	Merchants' Ex
Janiata Cons M Co	Neu	24	25	Jan 26	Feb 29	Mar 18	A Barra	304 California st	
Jacob Little Cons M Co	Washoe	Cal	2	25	Feb 14	Mar 17	Apr 5	W R Towne	380 Pine st
Josephine Cons M Co	Cal	15	5	Feb 5	Mar 9	Mar 27	J H Sayre	531 California st	
Kearney & S M Co	Cal	15	5	Feb 5	Mar 9	Mar 27	J H Sayre	531 Montgomery st	
Klamath Quartz M Co	Cal	3	300	Mar 2	Apr 10	May 2	J F Nesmith	315 Caifornia st	
Landon Quicksilver M Co	Napa Co	Cal	4	100	Feb 28	Mar 28	Apr 24	A Halsey	200 Sansome st
Mariposa Land & M Co	Cal	4	100	Feb 28	Mar 21	Apr 10	L Leavitt	Nevada block	
McMahon M Co	Neu	5	6	Mar 15	Apr 18	May 9	E Dean	419 California st	
Memorial Mt G M Co	Cal	1	5	Feb 8	Mar 18	Apr 14	Wm H Martin	328 Montgomery st	
Mount Savage M Co	Utah	3	10	Feb 24	Mar 21	Apr 20	D F Verdenal	409 California st	
New England Tunnel & Smelt'g Co	Cal	40	10	Feb 15	Mar 25	Apr 4	O Frisp	401 California st	
New Chicago M Co	Cal	1	10	Mar 1	Apr 2	Apr 15	M J McFarlin	419 California st	
North Ohio Virginia M Co	Washoe	2	25	Mar 9	Apr 13	May 14	J Maguire	419 California st	
North Dayton G & S M Co	Neu	1	5	Mar 14	Apr 18	May 6	R S Culverwell	320 Sansome st	
Ocean View Quicksilver M Co	Cal	1	50	Feb 12	Mar 20	Apr 15	D Ruck	Nevada block	
Oregon Bldg & M Co	Cal	9	10	Feb 4	Mar 13	Apr 13	W Wallace	Merchants' Ex	
Olympia R R & M Co	Oregon	1	100	Feb 15	Mar 30	Apr 29	W Wier	Nevada block	
Prussian Gold Hill M Co	Cal	7	100	Mar 10	Apr 12	May 11	R H Brown	402 Montgomery st	
Quadrangle Cons M & M Co	Cal	1	5	Feb 24	Apr 4	Apr 22	W F Bogart	324 Montgomery st	
Rutten Coal M Co	Washington	Neu	12	15	Mar 15	Apr 15	W H Johnson	21 Sansome st	
Santa Rosa M Co	Cal	12	50	Mar 7	Apr 15	May 23	A Ostrang	105 Front st	
Sheba S M Co	Neu	4	10	Feb 2	Mar 3	Mar 23	A Halsey	200 Sansoma st	
Superior G & S M Co	Washoe	1	5	Feb 29	Apr 3	Apr 20	J Tyeon	326 Montgomery st	
Table Mt Alpha M Co	Cal	10	10	Mar 1	Apr 5	Apr 26	L Leavitt	305 Montgomery st	
Point M Co	Cal	10	10	Feb 3	Mar 3	Mar 28	C Jennings	40 California st	
West Point G & S M Co	Cal	3	10	Feb 23	Mar 31	Apr 24	L Kaplan	Merchants' Ex	
Wyoming G M Co	Cal	8	100	Feb 23	Apr 3	Apr 24	J M Buntington	31 California st	

Name of Co.	Location.	Secretary.	Office in S. F.	Meeting.	Date.
Alps S M Co	Washoe	O D Snire	Stevenson Bldg	Annual	Mar 20
Amador Cons M Co	Nev	J M Buffington	31 California st	Annual	Apr 3
Am ricn Flaz M & M Co	Ely Dist	Geo R Spinyee	324 California st	Annual	Mar 23
Baltic Cons M Co	Nev	D C Thomas	419 California st	Annual	Mar 21
Bonnyvay G & S Co	Nev	O A Sanyer	321 Montgomery st	Annual	Mar 31
Chapparral Hill M Co	Cal	E K Stevengt	527 1/2 Greenwich st	Special	Mar 23
Constitution M Co	Nev	F Swift	419 California st	Annual	Apr 5
Corcoran Cons M Co	Nev	F Swift	419 California st	Annual	Apr 5
Dancy & S M Co	Washoe	O Llet by Trustees	3 1/2 California st	Special	Mar 27
Dancy G & S M Co	Washoe	Geo R Spinyee	320 California st	Annual	Mar 27
Enterprise Cons M Co	Cal	F J Hermann	418 Kearney st	Annual	Mar 29
Excelsior Tunnel M Co	Utah	O H Hermann	Merchants Bldg	Annual	Mar 21
Hale & Norcross M Co	Washoe	Called by Trustees	Nevada Block	Special	Apr 13
Jackson M Co	Eureka Dist	P W Shaw	408 California st	Annual	Mar 20
Knickerbocker M Co	Nev	Called by Trustees	321 Montgomery st	Special	Mar 20
Lacy Washington Co	Nev	D L Thomas	419 California st	Annual	Apr 3
Martha Bessie M Co	Cal	J W Toppage	330 Pine st	Annual	Mar 31
Melones Cons M Co	Cal	A D Carpenter	616 Clay st	Annual	Apr 8
Mint G & S M Co	Washoe	Called by Trustees	328 Montgomery st	Special	Mar 28
Phoenix S M Co	Nev	D A Jennings	401 California st	Annual	Mar 23
Rising Star M Co	Nev	J Macquire	419 California st	Annual	Apr 3
Sector Cons M Co	Nev	J W Cowage	330 Pine st	Annual	Mar 25
Virginia Cons M Co	Nev	O C Munro	419 California st	Annual	Apr 12
Ward G & S M Co	Nev	T B Wingard	318 California st	Annual	Mar 21
	Nev	J Macquire	419 California st	Annual	Mar 23
	Cal	J M Buffington	31 California st	Annual	Apr 17

Name of Co.	Location.	Secretary.	Office in S. F.	Amount.	Payable.
Alps M Co	Ely District	O D Squire	Stevens's Bldg	50	Mar 15
Beiler M Co	Wasco	H K Kiohe	419 California st	1 00	Mar 10
Black Bear Quartz	Cal	W L Oliver	316 California st	40	Feb 28
Cons Virginia M Co	Washoe	Chas H Fish	401 California st	10 00	Mar 10
Empire M Co	Nevada Co Cal	L A Jennings	401 California st		Sep 15
Empire M Co	Sierra Co Cal	Chas Connolly		5 00	Mar 15
Indian Queen M & M Co		A K Burbrow	Merchants' Ex	75	Dec 31
Leopard M Co	Nev	R H Brown	402 Montgomery st	10	Feb 15
Northern Belle M & M Co		W Willie	309 Montgomery st	1 00	Mar 15
Patric M Co	Cel	D F Verinal	415 California st	30	
West Comstock G & S M Co	Washoe	Oliver G Wood	543 California st	20	Feb 24

The usual dividends have been announced for the month, and a new one also, that of the Empire mine of Howland Flat, Sierra county, of \$5 per share. The dividends of mining companies, last month, amounted to \$1,368,600. The assessments delinquent this month aggregate an unusual sum, \$1,026,700; of this \$818,800 is on Nevada mines, \$97,900 on California, \$80,000 on Idaho and \$30,000 on Utah mines. The number of mining assessments delinquent in March, 1875, was 40, aggregating \$1,197,000, against 25 for the same month in 1874, aggregating \$748,600.

As will be seen by our list of new incorporations, the papers of the incorporation of two companies were filed last Saturday—the Chollar and the Potosi, each company to have 112,000 shares. These are the corporations which are to absorb the old Chollar-Potosi company, and the division will be four shares in each of the new incorporations to one of the old. This will give 224,000 shares to the 28,000 which comprises the present capital stock of the

The Yellow Jacket company, at the meeting held in Gold Hill on Wednesday, decided to increase the capital stock from \$2,400,000 to \$12,000,000, divided into 120,000 shares. It is not yet known when the new shares will be issued.

The collapse in prices of mining stocks over last week's sales shows no improvement, and the "bears" are still masters of the situation. These week fluctuations have been quite unimportant, although the volume of business done is quite large. Those who thought the break was to be only a temporary one found themselves mistaken, and the "shorts" on the rising market, what few there were, must be badly off.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

California.

AMADOR.

THE AMADOR CANAL.—*Amador Ledger*, March 4: The company is making several improvements on the canal. The dunes are being raised 12 inches so as to enable the ditch to carry more water than heretofore. When this is accomplished the canal will carry about 3,000 inches of water. Extensive improvements are being made at the bulkhead. Altogether these improvements will involve an outlay of many thousands of dollars.

BUTTE.

WATER DITCH.—*Butte Record*, March 11: We learn from H. F. Yokum, Esq., formerly of Dayton, Ohio, who was engaged in constructing a ditch to carry water to the Butte Creek mines, that they will be able to turn the water on to the upper diggings in about 20 days. The ditch will be extended some five miles further down, so as to cover most of the bank diggings along Butte creek.

BUTTE CREEK MINES.—*Dr. Brotherton* was in from Centerville on Wednesday, and reported the miners doing but little during the late rain, as it was too severe for them to work. Most of the canons were running with water. He brought in but little dust.

CALAVERAS.

GWIN MINE.—*Calaveras Chronicle*, March 4: We have intelligence of an exceedingly flattering character from the Gwin mine. Developments in the 1100-ft level are surpassing the most sanguine expectations. The ledge, at a distance of about 100 feet from the shaft, has widened out to four feet and shows the richest rock yet discovered in the mine. The first and second stopes are already opened and others will be got in readiness as fast as practicable. The batteries are in motion and operations are being vigorously pushed, both to mining and milling. Present indications are all favorable that the 1100-ft level will yield more money than any of those above it did. At no period has the Gwin mine had so promising a future before it as it has to-day.

GLENCROCK DISTRICT.—In spite of the bad weather, considerable quartz mining is being done in Glencrook district. The upraise in the San Bruno is progressing rapidly and will reach the surface in a few days. This contractor, Mr. Boughton, is pushing things. Good rock is being taken from the Hadlock mine at the depth of about 70 feet. A large quantity of first grade ore is in the dumps of the Albers mine. It will be crushed as soon as work can be got to run the mill. An accident occurred to the machinery on the Grasshopper mine last Tuesday, but damages have been repaired and the pumps were started again Thursday. Quartz mining operations will be very brisk in Glencrook district when spring opens.

INYO.

A NEW TRAMWAY.—*Inyo Independent*, March 4: Col. Stearns, of Cottonwood, called on us a few days since, having just returned from a business visit to San Francisco. During that visit he received the assurance of all needed capital with which to build and equip a solid tramway from the lake to Darwin. It is a grand enterprise, perfectly feasible and by no means costly, taking into consideration the Colonel's Cottonwood mine and saw mill, by means of which he can obtain the required timber at a nominal cost, copper actively speaking. Such a tramway, even now, would be put to near its capacity right from the start, in transporting ore, coal, timber and other freight to and from the lake. It is likely, however, that work upon it will be deferred till some of the principal mines, both in Darwin and Lee districts, which later lie near the line nearest Darwin, 16 miles distant, are opened. The project is a grand one, and will create an extensive business of itself, in addition to what it will do for the hack freight of milling ore which the New Coso company are preparing to send to a contemplated mill at the lake for reduction, the most of the ores from their mines being of that class and not of a character to require smelting, a circumstance, and the only one, that has hitherto retarded the progress of the New Coso company's operations. They have some of the richest and best mines of that class yet opened in Darwin, but the ores are "dry" and unfit for smelting, except by close sorting or admixture with those from mines belonging to other parties. Their furnace at Darwin, however, will be kept running with such ores as are required for the district, and the product will be sent to the lake. Here, in brief, we have an outline of a very important and promising enterprise, and all quite certain to be fairly under way if not wholly completed in less than 12 months from date. The natural conditions for the consummation of each and all of these projects could not be better if they had been planned on the spot.

ROCK SPRINGS DISTRICT.—*Cor. Oso Mining News*, March 11: Since the Inyo mining company made the purchase of the Nossano company's mines, the camp has changed its appearance, and, instead of being the resort of a few prospectors, is shaping itself into a busy mining camp. A town site has already been laid out, a station erected for the accommodation of those visiting the district, and the district has taken on a new and improved air, and work on the Garabaldi and North Star mines commenced. The district is fast filling up with strangers, in search of mines and labor. Among the new arrivals are Messrs. Gashweller and Maynone. Mr. Irwin, superintendent of the Inyo mining company, has established his headquarters at the North Star mine, and is only awaiting the arrival of the Nadeau's teams, with a full supply of mining tools, etc., to commence active operations on their several mines. Their prospects are indeed flattering, and it is the prediction of all who have seen the property that they have purchased, that theirs will prove the most prosperous of any mining enterprise on this side of the Sierras. They secured several well defined ledges, showing, probably, the richest average crop of silver ore yet found in the rich district of Virginia City, and much surprise is often expressed that they could have purchased it at so low a figure. There are other valuable ledges in the district, and ample room for other companies to invest; and, as spring advances, we will, no doubt, have quite an influx of capital, as there are several parties of prospectors who have been out at times of late springs, and more, and who hold ledges of considerable merit, from whom capitalists can purchase a set, or even several sets or groups of ledges, numbering from three to 10 or 12, and which now lie undeveloped, together with mill sites with sufficient water for milling their ores. The records show that about 165 ledges have been located in the past year, and for the year 1875. Dr. Goerge and E. M. Bentley have been working for the last three months on several of their ledges, and I am told have developed some valuable mines. They came here about a year ago, and, after making several locations, returned to their homes at Visalia, and having no success in the purchase of the mines here, returned with supplies for working their ledges, and merit their success, for it is such men that give a camp its stability.

DARWIN DISTRICT.—In the Defiance mine the drift from the bottom of the south wing hanging wall is now in a little over 100 feet, in ore all the way to the top of the drift. The drift is a solid body of galena. About 30 feet from the bottom of this winze a cross-cut has been run some 30 feet, through a body of galena and carbonate ore, the hanging or west wall not yet having been reached, and consequently it is impossible at this time to give the width of the vein. The ore taken from the drift will yield from \$100 per ton. The Defiance furnace has been running very successfully since our last report, with the exception of about 12 hours, during which time she was compelled to shut down for the purpose of repairing the water jacket, which had sprung a leak. Mr. Frank P. starts below to-day for the purpose of purchasing and settling on the construction of another furnace for this company. The shipments of bullion since our last issue include 930 bars of 80 pounds each; remaining on hand, 140 bars.

LEE DISTRICT.—On the recent visit of Mr. Taylor, the new superintendent of the Emigrant mining company, we were shown some very fine specimens of ore and quartz veins. It is mostly superfluous ore of a superior quality, and will, according to the estimation of Mr. Taylor, between \$700 and \$800 in silver. The machinery for the mill of the company arrived here some days ago, but cannot be transported any further than the mill, about two miles from the mill site, at present, on account of the prevailing snow. It will take about a month before the company can begin operations and have everything in running order.

NAPA.

CALISTOGA CONSOLIDATED.—*Cor. Napa Reporter*, Mar. 11: The weather this week has prevented me from visiting the Calistoga Consolidated quicksilver mine as I had intended. From Mr. R. K. Brown, the superintendent, I got the following facts. The mine comprises five claims, all of which have been worked more or less. The amount of tunneling is about 300 feet, and shafting 75 feet. The shaft we are now working is down 60 feet, with good ore all the way, and improving as we go down. The ore seen at the bottom of this shaft (No. 2) is about two feet in width, and growing wider as we go down. The water in the shaft is very pure. Work has been much retarded by the stormy weather, but we shall take hold in earnest, as soon as the weather permits. There is an abundance of wood and water at the mine, and an excellent site for a furnace. The mine is owned by Messrs. Erwin, Thatcher, Brown, Stacey and others, and has an excellent prospect. It is situated about 10 miles from the county road to St. Helena, and no roads will have to be constructed, as old wood road having been repaired to enable teams to reach the mine, which is about two miles south-easterly from here.

NEVADA.

THE GOLD YIELD.—*Nevada Transcript*, Mar. 9: It has been with more trouble than at first anticipated, that we have been enabled to get the following facts and figures of the amount of bullion taken out and shipped from that portion of Nevada county known as the Ridge. This includes only the bullion shipped through the express facilities of that section, with the approximate amounts that were sold to the Bank of Nevada County, and taken by private hands for the past year, 1875, from the 1st of January to and including the 31st of December of that year. From the banking house of Marks & Co., Moore's Flat, \$398,000 in round numbers. This large sum was all produced at that point and Relief Hill, including the several places in the vicinity. From Wells, Blooming, and the Bank of Nevada County, gravel mining company's mine, the sum of \$8,000 will here say this product from the top ground, as the company have not reached the bedrock in the channel of their mine at this writing by probably 20 feet or more. They have struck large boulders on the easterly rim, indicating conclusively that the channel of the ancient river bed still remains further to the north-west. The mine is situated on a bench, and the nearer they approach the bottom. This is without doubt one of the richest hydraulic mines in the county, or will be when opened in the channel and on the bedrock. At North San Juan the amount shipped reached \$322,557, a very large portion of which was produced from the top ground of the American company, at Seaboard, Nevada. The sum of \$178,000, all of which was shipped to the Bank of Nevada County, except a few thousand dollars shipped by W. Villard & Co.'s few months' run with a short water season. There was probably sold to the Bank of Nevada County, from Hustler & Son's mine, and Hawley Brothers' mine, with the amount taken from Humburg creek, by China-men, about \$30,000 in round numbers. These evidently represent a large amount of bullion, which have been carried off by private hands, and small parcels which should be estimated at not less than \$20,000. This gives the total yield from that portion of the county, of \$1,454,317. The reader must bear in mind that this large amount was produced in the year of one of the shortest water seasons known since '49. It would be safe to say that, after the several tunnels that are being run are completed and in good running order, that the above figures can be doubled yearly for the next quarter of a century.

PLACER.

BEAR RIVER MINING NEWS.—*Cor. Dutch Flat Forum*, March 9: The first claim you come to if you are Ucle Ritchie's, which at the present time is the banner claim of the river. He is now working on the upper portion of his claim with varied success, and the way he is situated, to some disadvantage, but every one in a while comes a nugget day. He has got some splendid rock to work, which I believe to be very good. The first claim you come to if you are Ucle Ritchie's, which at the present time is the banner claim of the river. He is now working on the upper portion of his claim with varied success, and the way he is situated, to some disadvantage, but every one in a while comes a nugget day. He has got some splendid rock to work, which I believe to be very good. The first claim you come to if you are Ucle Ritchie's, which at the present time is the banner claim of the river. 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THE ENGINEER.

Modern Engineering.

In our issue of February 25th we made some allusion to the Genesis of architecture and engineering, and passed in brief review some of the most noted engineering works of the ancients. Allusion was also made to the fact that but little was known of the engineering methods and mechanical appliances employed in those early days. Our present purpose is to give a brief resume of modern engineering.

Engineering progress in Europe, and indeed throughout the world, was stopped with the fall of the Roman empire. The barbarous hordes which passed over that continent from Western and Central Asia had no need of roads or bridges or temples. Their mission was one of destruction, and their presence hung like a pall of darkness over the world from the 4th to near the 10th century.

Modern engineering may said to date from the last named period, at which time a great building era commenced in Southern Europe and continued for about 300 years, during which time the great ecclesiastical structures which characterized that period were erected or commenced. While this work, remarkable chiefly for artistic excellence and originality and boldness of design was in progress, many other more strictly engineering works and works of utility were also undertaken, in the way of canals, and for the improvement of harbors and rivers. Canal locks, for transferring vessels from one level to another were first introduced in 1481. Their originator, Leonardo da Vinci, if he had left no more skillful or attractive work, would for this alone be entitled to the homage of the civilized world. But the great hydraulic works of Holland, constructed for driving back the sea and reclaiming vast tracts of valuable land, commenced as early as the 12th century, formed, with their accompanying machines for lifting water for drainage, the most formidable engineering works extant up to the time of the invention of the steam engine. The designers of those works thus became the leading engineers of the world, for the time being. The English were for many years—quite up to the time of Cromwell—dependent upon them for nearly all the engineering skill employed in their hydraulic operations.

The introduction of the steam engine in 17— and the consequent rapid extension of manufacturing industry opened also new and enlarged fields for the engineer. Previous to this time the ablest mathematicians, philosophers and men of science generally were called upon to advise and superintend great works of engineering. Archimedes was employed to devise works to defend his native city from its besiegers, and nobly fell while thus engaged. Some of the greatest philosophers during the era of the revival of letters, were called upon to take charge of great national works of improvement; among them may be honorably mentioned Torricelli, a pupil of Galileo. But, with the new impulse given to industry by the introduction of steam as an aid to mechanical labor, engineering took such a wide range and called for so much and such varied talent, study and experience, as to necessarily make it a school of itself.

It was at this time, too, that the profession took its modern title—engineer—from the term engine. The name was first applied, we believe, by the French—*ingenieur*, and was originally confined exclusively to one who had charge of a steam engine; but soon afterward received a more general acceptance, and from the Latin *ingenium*, a contriver, was applied to all who devised mechanical means to any desired end.

It is the province of the engineer to substitute for the slow and laborious toil of the hands and fingers some ingenious mechanical contrivance by which the same work can be done quicker and cheaper than by hand. The modern engineer is a great economizer, and a great civilizer as well. One pair of hands, through his ingenuity, is enabled to do the work of hundreds or thousands of unaided hands. Nearly all the artificial comforts of modern life are due to the skill and inventive genius of the engineer. His position, too, is often one of great responsibility. On the accuracy of his calculations in regard to the strength, position and fitting of materials depends the lives of the throngs who go out upon the deep in ships, and all who trust themselves to the awing bridge or the rushing car.

Again, it is the duty and privilege of the engineer to find employment for idle money, to devise ways for developing the resources of a State or nation, and means for the protection of that nation from the hostile attacks of its enemies. In carrying out this work he has revolutionized the art of war, both on sea and land, in the construction of iron-clad ships, iron roads and superior ordnance.

The engineer is called upon now to protect us from the invasions of water upon our valleys and plains, and again to lead that same element, for irrigating purposes, by convenient ways, over our farms and vineyards, all through those same valleys and plains. Again we look to him to protect our cities from disease and death, by bringing thither the life giving waters from great distances and through seemingly impossible ways. Then again we need his services to devise ways and means by which we may penetrate, for thousands of feet, into the

deep, dark recesses of the earth, to bring up therefrom the shining metals which give life and energy to commerce and industry. In short, it is the engineer's province to pioneer the way for all industrial progress; to look after the national weal and health and life, and to devise ways and means to improve the mutual economy of the world at large. Such are the varied responsibilities which have devolved upon this profession by the new conditions of society and industry which have grown out of the invention of the steam engine.

The introduction of the steam engine, through the ingenuity and method of the engineer, has given us the steamship and the railroad, which science has supplemented in the electric telegraph, with each of which, their history and accomplishments, the world is familiar. The two former have still further greatly enlarged the sphere of the engineer. Indeed, without him the railroads would still have been but little in advance of the original tramway, while the steamboat, to the present day, would have merely threaded its way through our rivers or hugged along the coast, unequal to the dangers of the open sea. Fifty years have scarcely passed since science scouted at the idea of a railroad car snipersing the stage coach, while it pronounced the project of crossing the Atlantic in a steamship the very height of folly! Now the railroad, almost our only means of traveling on land, spans continents and unites nations; while the smoke of our steamships darkens all the great ocean highways.

In England the Eddystone lighthouse, the Menai straits bridge, the Plymouth breakwater, the Liverpool docks, the Albert viaduct across the Tamor above Plymouth, and the Thames tunnel in London are all marvels of modern engineering. It was at the construction of the Albert viaduct that the distinguished engineer, Bunnel, first introduced the principle of excavating foundations for bridge piers by the use of an iron cylinder, within which the men worked under an atmospheric pressure varied according to the depth, sufficient to keep out the water by that pressure. The placing of the two main spans of this viaduct was also one of the greatest engineering feats ever accomplished. The central pier upon which they rested was 190 feet in height from the bottom of the foundation, viz: 20 feet from hard gravel to top of the mud in the bottom of the river; 70 feet of water above and 100 feet from water surface to the bridge to allow of the free passage underneath of the largest ships which were accustomed to pass up that estuary. To place these huge spans, (which consisted of tubes of boiler plate, arched in form, each 470 feet long, 17 in width and 12 in height, weighing 1,200 tons) they were floated out on iron pontoons, raised by hydraulic rams three feet every other day, as the main work of the pier progressed above the water until it reached its topmost course.

The engineering works in the United States are chiefly exhibited in our long and difficult lines of railroads, in our canals, fortifications, breakwaters and bridges. In the first and last we are in no sense inferior to any other country on the globe. The St. Louis bridge, lately completed, is a marvel of engineering; while the bridge now in course of construction between New York City and Brooklyn, is, perhaps, the grandest piece of engineering work ever devised.

With regard to the future of engineering—who will dare to predict? A distinguished Englishman recently said: "Engineering depends largely on experience; nevertheless in future times, whenever difficulties shall arise, or works have to be accomplished for which there is no precedent, he who has to perform the duty may step forth from any of the walks of life, as engineers have not infrequently heretofore done. The marvelous progress of the last two generations should make every one cautious of predicting the future. Of engineering works, however, it may be said that their practicability or impracticability is often determined by other elements than the inherent difficulty in the works themselves. Greater works than anything yet achieved remain to be accomplished—not, perhaps, yet awhile. Society may not yet require them; the world could not at present afford to pay for them."

LIGHTHOUSE BUILDING UNDER DIFFICULTIES.—A celebrated French lighthouse is that of Eaux-de-Brehat, a recent erection, based upon a huge and treacherous porphyry rock, for ages a terror of every seaman who approached the Brittany coast. Its architect had to encounter every species of obstacles during his work, but, above all, incessant races and eddies of the sea among the neighboring sandbanks. The foundations had to be sought for far beneath low water; an artificial port had to be created; the necessary stone work was hewn and shaped on the island of Brehat, seven miles distant. Even when the foundation wall had appeared above the water the lower walls of the lower story were submerged twice a day, leaving heavy deposits of marine plants, shells and seaweed. The workmen lived in huts upon a reef, to which they retired when the tide rose; and then they pushed on their labors, quarrying and squaring at one time, arranging and fixing at another. There was a masonry almost without mortar. The blocks were grooved and literally dovetailed together, the course being connected, as it were, by cogs, so that every part relied upon every other, the result being, as nearly as possible, an absolute cohesion. In spite of this happy issue the reporting architects would not recommend similar experiments in the future.

Street Railroad Locomotion.

An experiment which was made recently just outside the walls of Paris promises to effect far greater results than was anticipated, even if it does not produce a sort of revolution in the ordinary means of locomotion. The object was one which has been over and over again attempted to attain—that is to say, the substitution of steam for horse power on tramways. But the innumerable inventions by the aid of which it has already been attempted to solve the problem have all been open to fatal objections on one score or the another. Either the machines constructed have been too slow, or too cumbersome, or too noisy, or too expensive, or even too ugly; for the horse, which next to mankind has hitherto, at least, had the best right to the road, will not endure a competitor whose hideousness of aspect exceeds a certain reasonable limit.

But the tram car in which a French engineer has now solved the difficulty appears to be free from almost, if not quite, all these manifold defects. From its elegant white chimney issues a faint white vapor, whose delicate appearance is rather pleasing than repulsive. The brake power is capable of prompt and efficient application, and the engine is packed into a case which is neither extravagantly large nor intolerably ugly. The whole cost of feeding and working it is estimated at only 20 francs a day, whereas the total expense of maintaining a pair of horses working an equal number of hours amounts to a great deal more.

But the grand triumph is, perhaps, the speed with which the steam tram car travels. Between the Porte de Chatillon and St. Germain des Pres its mean pace—up and down a slight incline—was just 300 metres to the minute, that is to say, a rate of at least 10 miles an hour with a full load of passengers. The experiment was witnessed by a number of public dignitaries, including the director of the works, and it is obvious that a step has been made towards utilizing steam power upon roads which may lead to the most serious results in a commercial, economical, and, more especially, an agricultural point of view.

The following, from *L'Illustration Universelle* (Paris), doubtless describes the machine alluded to: "This machine, based upon the elasticity of compressed air, presents in its make-up the appearance of an ordinary street car. In front is placed the platform, upon which the conductor takes his place. Under the frame work, supporting the box, are placed sheet-iron cylinders, fixed transversely, proved to bear a pressure of 30 atmospheres, into which the air is forced by a pump moved by steam power, although the air is stowed away at the enormous pressure of 30 atmospheres, that it may occupy the smallest possible space, and consequently be more portable, the compressed air need not be used at a greater pressure than of three, four or five atmospheres, according to the loads to be carried, or the obstacles on the road. It then became necessary to invent a particular system of expansion, which should not allow to pass into the motor-mechanism more than the exact quantity of air required to produce the necessary effect. This mechanism is placed on the front platform, is operated by the hand by means of a wheel, by the conductor, who can, by observing the pressure on two indicators, regulate the flow of air into the cylinders, and consequently increase or retard the rate of speed of the car. But it is known that air is heated when compressed, and that it cools, more or less, according to its expansion. The inventor of this car has guarded against this danger by making the air run into a reservoir of water heated to 180 deg. It is thus passed into the motor-cylinder under the car, heated and covered with moisture."

The advantage of some such system of street cars, moving without smoke or any of the noise peculiar to steam machines, and presenting no danger from fire explosion, must be obvious to all. Whenever such a machine is found that will combine the above conditions, it will soon come into general use and be considered a public blessing. It is further said of this Paris machine that it is capable of doing the work of 200 horses for \$10 per diem of outlay.

ENGINEERING DREAMS BEING REALIZED.—George, when in his 78th year, said there were three things he desired to see: A canal connecting the Gulf of Mexico with the Pacific ocean, another connecting the Rhine and Danube and lastly, the English in possession of a Suez canal. "I should like to see these great things," said he, "and for them it would be worth while to endure another 50 years." The English came into possession of a Suez canal just within the half century.

The tunnel, as projected under the English channel, will be 16 miles long and 250 feet below the bed of the sea.

A few days ago Mr. Keyes, the superintendent of the K. K. Consolidated mine, says the Eureka Sentinel, discovered in the fifth level of that mine several skeletons of kangaroo or wood rats. The rodents, upon the approach of death, of which they have an instinctive knowledge, seek some dark place, oftentimes, as in this instance, finding their way into apertures in the rock or earth hundreds of feet below the surface. The discovery of these remains prove conclusively the connection of the oases with the outer world, and is a strong argument in favor of the theory that the water in the mine comes from the surface.

Silver Lead Ores.

Smelting and Base Bullion Production of California.

A correspondent of the *Coso Mining News* writes to that paper as follows: The discovery on this coast of large deposits of argentiferous galena, and other ores requiring treatment by the process of smelting, imparts to this class of deposits and method of reduction particular interest at the present time. As the locality in which the earliest of these discoveries were made, and in which the mode of treatment was first introduced, and where it has since reached the most satisfactory results, the Cerro Gordo district, Inyo county, has special claims on public attention; having received in that locality their first practical lessons in the metallurgy of this class of ores, our people will naturally incline to adopt the plans there employed, and look that way for further information on the subject. With a view to applying a few of the more prominent facts connected with the history of that district, and some other data pertinent to the matter in hand, we yield for that purpose such space as can now be spared.

Locality and General Features.

Cerro Gordo, meaning in the Spanish the "Hill of Riches," lies on the westerly slope of the Coso mountains, a high range situated some twenty miles east of the Sierra Nevada, from which it is separated by Owen's river valley. This district lies at an altitude of between 6,000 and 7,000 feet, being a thousand feet or more above the valley adjacent. These mountains are covered with a good soil, which produces a rich pasturage of bunch grass and a scattered growth of timber, consisting of pinon, cedar and mahogany. These trees, although of insufficient size to make good lumber, are unsurpassed for fuel, the pinon and mahogany making also the best of charcoal. Lumber for this region is procured from the Sierra Nevada on the opposite side of Owen's valley, the timber on these mountains being large and abundant. Flowing through the canons along the western face of the Coso range are many small streams, alike serviceable for irrigation and mining purposes. Though so elevated, but little snow ever falls in the Cerro Gordo district, nor is the cold at any time extreme, though the summers are warm. The water is good and the climate invigorating and healthy. Owen's river valley contains much fine agricultural and grazing land, all the products of the farm and dairy being supplied to the neighboring mining camps at moderate prices.

The Discovery of These Mines

Was made by a company of Mexicans prospecting the foothills here 12 or 13 years ago. Their acquaintance with this class of ore in their native country enabled these people to appreciate its value, wherefore they stopped, put up rude furnaces, and commenced running out the metal, the most of them having remained here since, working in a small and inefficient way. About eight years ago, two unskilled but industrious and energetic men, Belshaw and Beaudry, came into the district, and being satisfied of its wealth they too concluded to remain and go to work. Like their predecessors their earlier efforts were confined to a small scale. But they were not the men to be contented with this. They commenced experimenting on the ores, and overcoming such minor difficulties as presented themselves, gradually multiplied and enlarged their furnaces, acquired additional properties, worked hard, and finally so extended their operations that they now count their annual product of bullion by the thousands of tons. Their principal mine, and that from which the most of the ore for running their furnaces have been taken, is the Union, they being owners also of many other claims. Several other companies are carrying on a thrifty business here, opening up their mines, smelting the ores, erecting new furnaces, and otherwise extending their improvements, while others again are driving deep explorations and work-tunnels designed to develop and drain an entire series of lodes to a great depth. Among the more active and prosperous organizations operating here are those of the Potosi mining and smelting company, the Swansea company, and the Owen's Lake silver and lead company, all the owners of valuable franchises, properties and improvements, the last two having also smelting furnaces in operation. To aggregate a little, there has during the past seven years been invested in this district, including only outlay of leading companies, something like \$130,000. The production of base bullion meantime has amounted to, say, 25,000 tons, worth \$5,000,000, and from which there has resulted a net profit of \$2,500,000. Two years ago the lead, or base bullion so called, had accumulated here to the extent of 2,000,000 pounds, compelling the principal furnace men to engage the services of no less than 80 12-mule teams to haul it to Los Angeles—the return freight teams, though large and numerous, being unable to keep the stock reduced to a reasonable limit. It must be understood that the \$130,000 referred to did not consist of money borrowed or brought in from abroad; it was the fruit of current net earnings, for this has been not only a self-made, but a self-sustaining district from the first.

What promises to accomplish more for this district than any or perhaps all other enterprises combined is the great

Exploring and Working Tunnel

of the Potosi mining and smelting company, now in course of construction. Before proceeding to describe the features and objects of

(Continued on Page 186.)

USEFUL INFORMATION.

How to Get Rid of Household Pests.

I have not seen a bedbug or flea in my house for many years. If an army of them were to be brought in, mercury would speedily exterminate them; but I think cleanliness the best and perhaps the only preventive. The common house fly I do not molest, believing that it more than compensates for its trouble by clearing the atmosphere of effluvia and the animalcules which always arise from the putrefaction of decaying substances during warm weather.

So also with the birds, which are quite numerous here during the summer. Instead of shooting them or setting up scarecrows to frighten them away, I throw out every possible inducement for them to build in my fruit trees. The birds capture a large share of the insects in the larva state, and thus the millers are prevented from depositing eggs for future worms. As to the loss of fruit by the birds, this latter are always sure to be on hand in force in the season of ripe fruit, whether they come early to take the worms or not.

For the residue of insects that infest my vegetable garden, I find that the laboratory of the chemist furnishes materials fatal to them all, among which white bellerose and cayenne pepper are of the most ability. The bug or worm which cannot find vegetation unflavored with these articles will seek its breakfast elsewhere and leave a garden unmolested.

A few drops of carbonic acid in a pint of water will clean house plants from lice in a very short time. If mosquitos or other blood-suckers infest our sleeping rooms at night, we uncork a bottle of pennyroyal, and these insects leave in great haste, nor will they return so long as the air in the room is loaded with the fumes of that aromatic herb. If rats enter the cellar, a little powdered potash thrown into their holes, or mixed with meal and scattered in their runways, never fails to drive them away.

Cayenne pepper will keep the buttry and storeroom free from ants and cockroaches. If a mouse makes an entrance into any part of your dwellings, saturate a rag with cayenne in solution and stuff it into a hole, which can be repaired with either wood or mortar. No rat or mouse will eat that rag for the purpose of opening communication with the depot of supplies.—*Scientific American*.

A Hint to Young Mechanics.

Two things are uppermost in almost every industrious young man's mind: the desire to make and save money, and to be established in business for himself. Now, as an encouragement to persevere in that industry, also in faithfulness, close attention to business, and also in improvement of the mind, we suggest that a few dollars placed at interest will grow in amount wonderfully fast, if the interest is also invested and a few dollars regularly added to it. The evenings usually spent in idle ways, if devoted to scientific, practical books and papers, will in a few years make a young man educated and prepare him for directing an establishment of his own. Remember it is the most skilful, artistic and finished workman that rises above his fellows. When you have mastered your trade and find your mind stored with useful hints and thoroughly scientific knowledge, then turn to a partnership or part interest in business with your employers. Your standing and the little capital saved will help you wonderfully. If each a part interest is not practicable, select a collaborator and commence in a one-story, one-roomed office, with a particular specialty of which you are masters. Push to completion in perfect workmanship each small order as you can persuade the public to extend you. Remember that personal application, integrity and industry will, in a few years, bring their reward. They always have, and they always will.—*Mechanical Journal*.

ORIGIN OF RAILROAD GAUGES.—DIFFERENT VARIATIONS.—An eminent engineer states that the origin of railroad gauges occurred as follows: George Stephenson adopted the four feet nine inches gauge for the reason that it was used in all the horse vehicles in England; and when the parts of the first locomotive were ready, and were put together, owing to some unexplained cause it proved to be only four feet eight and one-half inches in gauge, and lo! the whole railway world have followed the pattern thus produced, and hence our present standard. A correspondent of the *Scientific American* writes that journal as follows: "My book of reference says that the gauge was originally five feet, and the flange of the wheel was on the outside. That not working satisfactorily, the flange was changed to the inside, which makes the measurement four feet eight and one-half inches." Another correspondent of the same journal says: "The first railroads were constructed for coal traffic, and were of the same gauge as the colliery tramways, four feet eight and one-half inches; and the latter are so old that no one can now tell why this width was chosen."

SPOKEN LANGUAGES.—Dr. Butler, of the Methodist mission in Mexico, draws attention to the fact that the Spanish language stands third in the list of European tongues, being spoken by more people than any others except the English and German. Of the 50,000,000 for whom the Spanish is the mother tongue, over 29,000,000 live on this continent.

Things To Be Remembered.

A cotemporary furnishes the following as important matters to be kept in mind by all farmers. There are many others than farmers who will do well to bear more constantly in mind the same class of facts. We quote:

One of the most important things in any business is the preservation of what has already been acquired, whether of one character or another. For instance, there are the machinery and implements essential to farm work, and these must be taken care of. French experimenters hold that the friction of wooden surfaces rubbing on each other amounts to from one-quarter to one-half of the force employed. The friction of metal on wood is less; and that of metal on metal is from one-fifth to one-seventh. Lard, applied to wood surfaces, reduces the friction from 1-10th to 1-25th of the power required to move the surfaces, and on metal surfaces the friction was reduced one-half. These facts show the importance of lubricating machinery regularly—a fact that every farmer knows perfectly. Yet it is often neglected, and if the losses sustained by the average farmer in 10 or 20 years from this neglect could be actually computed every one would be astonished at the large amount.

It has often been observed that a common error in lubricating machinery is, that too much oil is applied. Whatever excess of oil is applied is necessarily a total loss, as surfaces in rubbing can use only so much oil; and though the loss at each application may be very small, in the course of a quarter of a century it will amount to a considerable sum. There is, too, a knowledge necessary even to the simple act of lubricating a wagon. The axle should be carefully cleaned by wiping, and the boxes require the same preparation for the reception of fresh oil, though good wagoners only attend to this last. We have seen, in more than one instance, a want of knowledge to clean the boxes, yet nothing is more simple. A cloth twisted around the axle to make it fit the hole through the hub, and the wheel made to revolve a few times, will effectually clean the boxes, so that the fresh oil will touch every point of the friction-surfaces in the hub. Machinery properly cared for will last double the time that it will if not properly cared for. This is a fact well attested.

For kitchen and pantry floors there is nothing better than a coat of hard paint. The cracks should be filled with putty before it is applied, and the paint allowed to dry at least two weeks before using. Then it is easily kept clean by washing (not scrubbing) with milk and water; soap should never be allowed to touch it. "Red lead and yellow ochre I prefer for coloring; the former makes a hard paint that wears well."

A LARGE lake has been discovered about 40 miles west of Laramie, W. T., in the bottom of which is a thick layer of sulphate of magnesia or epsom salts in almost a pure state.

A TRIPLE RAILWAY.—A third set of rails is to be laid on the Erie road from Elmira to Buffalo, to allow cars of the Lehigh Valley to be run through.

BLAST FURNACES IN GREAT BRITAIN.—At the close of 1875 there were 993 blast furnaces in Great Britain, but only 582 of the number were in blast.

GOOD HEALTH.

The Skin.

We desire to present a few brief and practical remarks upon this subject, without indulging in abstruse technicalities.

If as much, there is no structure of the physical body more widely distributed than the skin. It not only covers the external surfaces of the form, but reflects inwardly at every orifice, and, creeping into every cavity, lines the whole internal physique. What are commonly known as membranes may, with equal scientific propriety, be recognized as forma and modifications of skin.

The skin is best known as endowed with secretory functions; therefore, we shall confine our present brief statement to matters illustrating the natural law of secretion. Everywhere the skin sustains an adaptation to pouring forth some form of products for a wise and specific end. On the outer surface of the body it exudes perspiration, an oil for lubricating, and various effete matters from the armpits, toe-angles, etc.; in the nasal passages, throat and lungs, mucus; in the stomach, gastric juice; in the liver, bile; in the kidneys, urine; in various other localities, cardiac fluid, synovial fluid, prefrontal fluid, etc.

Whoever regards his body wisely will consider the importance of maintaining a proper activity of all the dermal functions. Especially is this true in view of the reciprocal relations certain of these functions bear to each other. To illustrate, if the functions of the external skin are unduly suspended, the internal skin will try to make up the deficiency by overwork. The same is true in a reverse contemplation. This explains why "closing the pores of the skin" will be frequently followed by an increased discharge of mucus from the bowels, or diarrhoea, as well as the same from the cavities of the head and fauces, or catarrh, and a great many similar compensating effects are accounted for in like manner. Last summer

we came in contact with a stranger, whose every outward aspect was indicative of the most scrupulous cleanliness and tidiness. Yet this very presence of the individual revealed a most intolerable stench. We doubt if the person most interested in it was aware of it. It proceeded from an undue secretion of the glands of the armpits. We have not a particle of doubt that the circumstances were owing to some other defective secretion in this way sought to be compensated.

Cases like the one we have related are very frequent and often exhibit more extended effects. The outer skin often secretes or perspires too much, because the inner skin secretes too little. In such a case, bathing and washing will accomplish but little in the way of relief. One may thus remove a quantity of detergent matter, only to have more supplied in its place. However, persons afflicted in this way will be less liable to direct injury from bathing than those in whom the predominance of force is exerted inwardly upon the mucous membranes, inciting most likely some form of chronic catarrh. Such are shivering and cold, and look with horror upon the face of water. If they persist in bathing they are liable to serious injury unless they use water only of an agreeable temperature, avoiding drafts of air both during and after the process. When experience shows weakness inclined to follow bathing, it should be practiced with great care, followed by a season of sassa and repose.

As a rule bathing is good for everybody. Excepting persons engaged in dirty employments, once a week is sufficient for those sustaining a healthy balance of secretory functions. Nor need it then be so thoroughly detergent as many imagine. A towel or sponge saturated with soapy or slightly alkaline water will soon do all that is required, unless one hates for pleasure. Friction of the dry towel or band, the air and the attendant muscular exercise are highly beneficial; weakly, or catarrhal subjects, however, should be handled tenderly.

A tree is hardly killed by cutting off the top-most boughs. Simple bathing is hardly a remedy for deep-seated ills demanding more general means of correction. We have not told all we have even thought upon the subject of the skin. We would like to say more, but we have a vision of Mr. Freas' waste basket.—*Germania Telegraph*.

Diphtheria.

Diphtheria was an almost unknown disease 20 years ago. To-day it has nearly assumed the proportion of an epidemic in many localities. It attacks adults as well as children, but its ravages are chiefly among the young and feeble. The dread which parents formerly felt of scarlet fever has given place to the dread of diphtheria, and the rapid and fatal character of the disease makes it more formidable than any other of the diseases to which children are peculiarly liable.

It is sufficiently well established that diphtheria originates, at least in very many instances, from defective drainage and sewer gas. The poisoned air and polluted water which are the conceded causes of typhoid fever are equally fatal in developing diphtheria.

Diphtheria is not a difficult disease to combat when it is treated in time. The distinctive feature of it is the formation of a false membrane in the throat. This marks its appearance in nearly all cases in the shape of grayish brown patches; and hence it is of the utmost importance to watch closely the throats of children who are apparently ill with cold and sore throat. In most cases there is fever and prostration in the early stages of the disease; though in rare instances the false membrane is formed suddenly and almost without warning. If the throats of ailing children are frequently examined, there will be little danger that parents will mistake incipient diphtheria for an ordinary cold. Scores of children have died of diphtheria who would undoubtedly be now alive had the grayish brown patches in the throat been discovered at their first appearance, and a competent physician been promptly summoned.

THE PULSE.—Every person should know how to ascertain the state of the pulse in health; then by comparing it with what it is when ailing, he may have some idea of the urgency of his case. Parents should know the healthy pulse of each child, as now and then a person is born with a peculiarly slow or fast pulse, and the very case in hand may be of that peculiarity. An infant's pulse is 140; a child of seven about 80, and from 20 to 60 years it is 70 beats a minute, declining to 60 at fourscore. A healthy grown person beats 70 times in a minute; there may be good health at 60, but if the pulse always exceeds 70 there is a disease; the machine is working itself out; there is a fever or inflammation somewhere, and the body is feeding on itself, as in consumption, when the pulse is quick, that is over 70, gradually increasing with decreased chances of cure until it reaches 110 or 120, when death comes before many days. When the pulse is over 70 for months, and there is a slight cough, the lungs are affected. The pulse decreases, when a recumbent position is assumed for any length of time, and is increased by exercise stimulants and the presence of food in the stomach.

ONESITY.—The best remedy is to eat moderately of sugar, starch, and butter, and make the diet largely of fruit and grains. It is a very simple matter, and requires no long labored article. Daily vigorous exercise should be taken, and in the morning a cold bath.

DOMESTIC ECONOMY.

Household Hints.

A lady in McGregor, Iowa, sends these: A strengthening liniment, good for lameness, weakness; also for bathing the stomach in cases of dyspepsia—take one beef's gall, two ounces of origanum oil, one pint alcohol; mix thoroughly; keep tightly corked; shake well before using.

One of the best cements for crockery is to mix lime with the white of an egg. To use it take a sufficient quantity of the egg to mend one article at a time. Shave off a quantity of time and mix thoroughly. Apply quickly to the edges and place firmly together, when it soon sets and becomes strong. Calcined plaster of paris will answer in place of the lime.

If brooms are wet in boiling suds ones a week they will become very tough, will not out a carpet, but last much longer, and always sweep like a new broom. A handful or so of salt sprinkled on the carpet will carry the dust along with it and make the carpet look bright and clean. A very dusty carpet may be cleaned by setting a pail of cold water out by the door, wet the broom in it, knock it to get off all the drops, sweep a yard or so, then wash the broom as before and sweep again, being careful to shake all the drops off the broom, and not sweep far at a time. If done with care it will clean a carpet very nicely, and you will be surprised at the quantity of dirt in the water. The water may need changing ones or twice if the carpet is very dirty. Snow sprinkled over a carpet and swept off before it has time to melt and dissolve, is also nice for renovating a soiled carpet. Moistened Indian meal is used with good effect by some housekeepers. The broom wears out carpets as much as feet do.

Cooking by Cold.

It is a curious fact, not generally known, that the action of intense cold on organic substances is similar to that of a high degree of heat, and that, when subjected to a very low temperature of heat, meat can be brought to a condition similar to its state when cooked by actual warmth. Quite recently a Hungarian chemist, Dr. von Sawiczawsky, who, it appears, has investigated all the various ways suggested for preserving meat (by chemicals, cooking by heat and hermetically sealing, etc.), and has found points of objection to all, has attempted the preparation of the material by subjecting it in a perfectly fresh state to a temperature of 33° below zero, Fahr., and sealing it afterwards in tins. The results obtained have been highly satisfactory; the meat on being removed from the cans appears, in point of smell and color, as fresh as if just taken from the butcher's stall. Although partially cooked, and thus requiring less fuel to complete its preparation for the table, it is entirely without the taste of meat which has been partially subjected to any heating process, and may be roasted, broiled, or otherwise treated, the same as if it were fresh. A commission appointed by the German government has lately conducted a series of careful and successful experiments upon the process; and as a final test two cassettes of the German navy, being about to circumnavigate the globe, have been supplied with a large stock. An extensive factory is being erected in Hungary for its manufacture.—*Sci Am*.

DISH WASHING.—Mrs. S. B. Sawyer, in the *Country Gentleman*, very pleasantly instructs how to wash dishes so as to make it "fun." Let me describe, by way of contrast, another method, which is anything but fun, to the intelligent looker-on at least. Wash the dishes indiscriminately, without regard to their different condition, and without scraping; put them dripping from the greasy suds into another pan, bottom up. When the pan is full, pour over them a dipper of hot water, and thus "make clean the outside of the cup and the platter, but within"—etc. Then take them directly from the water to towel, which is thus made soaking wet in a few minutes.

Dishes should always be drained a few seconds after rinsing, as it saves half the labor of wiping, and keeps the towel in better condition. Your correspondent refers to a draining rack, which is no doubt useful; but the plan practiced and taught by an excellent housekeeper of my acquaintance, was to drain the dishes on a cloth laid in the bottom of the sink. This keeps them from slipping and thus getting cracked, and also absorbs the water; and an extra dishcloth of good size, kept at hand for the purpose, will be found convenient. These homely tasks are honorable because necessary, and it is beneath the dignity of no lady to learn the best methods of performing them.

WASHING FLANNELS AND LINENS.—To whiten flannel, made yellow by age, dissolve one and a half pounds of white soap in 50 pounds soft water, and also two-thirds of an ounce spirits of ammonia. Immerse the flannel, stir well around for a short time, and wash in pure water. When black or navy blue linens are washed, soap should not be used. Take instead two potatoes grated into tepid soft water (after having them washed and peeled), into which a teaspoonful of ammonia has been put. Wash the linens with this, and rinse them in cold blue water. They will need no starch, and should be dried and ironed on the wrong side. An infusion of bay will keep the natural color in buff linens, and an infusion of bran will do the same for brown linens and prints.



W. B. EWER.....SENIOR EDITOR.

DEWEY & CO., Publishers.

A. T. DEWEY, OEO. H. STONOR
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Office, No. 224 Sansome St., S. E. Corner
of California St., San Francisco.

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THE ORIGINAL ARTICLES in this paper are mostly set in solid type, giving in our columns one-third more reading than is contained in ordinary leaded matter.

Our latest forms go to press on Thursday evening.

San Francisco:

Saturday Morning, March 18, 1876

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The "Press" at the Chile Exposition.

A prophet is not without honor, etc. We have a communication from Wm. C. Quincy, Santiago, Chile, as follows: "I have the pleasure to inform you that your publications have been awarded the Grand Bronze Medal of the Chilean Exposition, the highest award granted your class of publications." We modestly deck our cap with this new feather.

NEVER before in the history of Virginia City have the slopes of Mount Davidson been so completely covered and so great a depth with snow. Upon the north and northeast slopes of Mount Davidson the snow has fallen and drifted to a depth of from eight to 40 feet in the canon on the north side of the mountain. A day or two of warm weather would render the danger of an avalanche imminent.

THE fire at the Belcher mine on Saturday was confined to the rope house. The Belcher fire brigade, aided by the Liberty and Yellow Jacket hose companies, of Gold Hill, soon deluged the burning building with six streams of water, thus preventing the spread of the fire to the works.

THE Idaho papers state that many lies have recently been filed on mines in that Territory for work done on them.

The Mining Debris Question.

The mining debris question has received the consideration of two of the Assembly committees and two reports have been made. The Committee on Agriculture sets forth anew the farmers' grievance. It recounts the loss by covering fertile fields with the thick deposit from hydraulic washings; the danger of a thousand times greater damage which must result from the improved systems of hydraulic mining if no remedy is devised to counteract its effects. In the main the report of the Committee on Agriculture recites the same facts which we have laid before our readers in reports of farmers' meetings in the threatened districts and in the bill which was presented in the Assembly asking for a commission to examine the evil and report a way of obviating it. The report of the committee recommends the establishment of such a commission "to investigate and report upon the feasibility of utilizing the debris," and to co-operate with the engineers whom the United States Government is asked to appoint to examine the threatened danger to navigable streams from the same cause which lays waste the farmers' fields.

The report from the Committee on Mining acknowledges that damage has been done in some cases, but claims that the service of the mining population in affording a market for the agricultural productions of the foothill counties and the effect of mining enterprises in storing up water in winter to feed the streams in summer, are matters for the public good. It alludes to the fertilizing quality of the detritus and instances the effect produced by the earthy matters which have been deposited by the Nile. The report of the Mining Committee is perhaps as good a showing as could be made in the interest of the miners, and we publish it in full in another column of this issue of the Press. The miners agree with the agriculturists that the whole matter should receive a strict and complete investigation by scientific engineers, and petition the United States Government for a commission to execute this work. Thus the matter ends, and thus probably it will remain, a contested matter among rival interests, until some thorough searching shall discover the true adjustment of the difficulty.

This substitute for Assembly concurrent resolution No. 17, offered by the Committee on Mines and Mining, is addressed to Congress, and sets out the allegations of its agriculturists relative to hydraulic mining and its damage to agriculture, to rivers, harbors, cities and towns. That these allegations involve interests of vast magnitude, and engineering theories and practice of such intricacy, that the Government should appoint a board of engineers to examine and report upon the problems and all facts connected with hydraulic mining, and the disposal of the tailings in such a manner that no damage may be caused thereby. Upon the receipt of such a report the State and General Government can act intelligently and wisely upon the whole matter, without crippling the mining interest, or permitting the agricultural interests to suffer.

The Government should institute inquiry into the subject, because it has sold its gravel mine for the express purpose of their being washed out, just as it has sold land to the agriculturists for the express purpose of being tilled. Both classes are entitled to Governmental consideration and exemption on this subject, that means may be devised to remedy or alleviate the damages alleged.

That the navigable streams of the State are under the care of the Government, as also are the navigable bays.

That now when specie resumption is engaging the attention of the country, any steps to effect the production of gold mines become of national consequence.

The Government has in its pay competent engineers, unbiassed, and having no interests involved. If the State conducts the examination, it is feared those in one or the other interest will have a controlling influence in the Board, and thus give it a partisan character. The cost of such a commission to the Federal Government would be inconsiderable, while one by the State would be large, and the result not so satisfactory.

Therefore Congress is asked to take such action as may be necessary, and to detail competent engineers to a commission to investigate the subject.

MINT APPROPRIATIONS.—The amounts recommended by the House Appropriation Committee for the salaries of officers and clerks of the San Francisco mint and Treasurer's office, are fixed in accordance with the committee's general policy of cutting down pay 10 per cent. and the force 20 per cent. throughout all the departments. The item for wages of workmen and adjusters is \$225,000. The total appropriations of every description for the Carson mint are \$48,350, against about \$210,000 last year. No appropriations are cautioned for either superintendent or collector, and the item for wages is reduced to \$10,000. In short, the committee proposes to make the institution merely an assay office.

THE amount of bullion taken out and shipped from that portion of Nevada county known as the Ridge, for the year 1875 is \$1,154,817. The Transcript believes that with the proper facilities and a sufficient supply of water this amount can be doubled yearly for the next 25 years.

Reversible Water Power Hoisting Machinery.

There is no limit to the discoveries of science, and no difficulty of a mechanical nature which the man possessed of a true inventive spirit is willing to admit as unmountable. While the inventor must have considerable originality in the complexion of his mind, yet this characteristic alone is not sufficient to invest a man with the honored name of inventor. He must not only have the genius to conceive of new combinations of the mechanical laws, but also the strength of will and moral courage to give practical value to the creations of his brain. When an individual forsakes the beaten track of experience, and endeavors to give a tangible form to the devices which have been conjured up by his fertile imagination, the sneers and derision heaped upon him by lesser men than himself are often a greater strain upon his moral nature than the original ideas which are struggling into mechanical shape are upon his intellectual forces.

A Difficult Problem.

The construction of a reversible water power to supersede the reversible steam engine used for hoisting purposes in our mines has been regarded as an impossible task by some of the ablest mechanics of the day. All of them readily concede the immense importance to mining industry of an invention of this kind, but the many obstacles in the way of its attainment led them to place it beyond the range of possibility. There were two principal reasons assigned why water power could never be utilized for hoisting. 1st. That water could not be brought under such perfect control as would enable the engineer to regulate the speed of hoisting or lowering to suit the miners in the shaft. Human life is involved in the matter of hoisting, and it is therefore necessary that the bucket, ascending or descending, should be made to answer readily the wishes of the miners, as is now done by steam. It has long been ascertained that the mere hoisting and lowering could be accomplished with water as the motive power, but the real difficulty was to instantly increase or lessen the speed so as to guard against accidents. The second difficulty was this, if the water gate was so arranged as to shut off the water instantly in the pipe, the concussion of the water would be very apt to burst the pipe. So that while it was requisite to shut off the water suddenly at times to gauge the speed of the bucket, or bring it to a standstill, this pent-up water would become a source of peril from the violence of its reaction.

The Problem Solved.

It was reserved for the genius of a mechanic of Amador county to master this problem, and thereby impart a new impetus to the mining interests of the State. S. N. Knight, of the firm of Knight & Co., mechanists and foundrymen of Sutter Creek, has been quietly experimenting for the last three years with the view to remove the difficulties surrounding this subject, and now has the satisfaction of seeing his labors crowned with success and his most sanguine expectations realized. Mr. Knight is deserving to be classed as one of the best mechanists in the State. In addition to a thorough knowledge of machinery and the laws of mechanics, he possesses to an eminent degree the faculty of combination and an undaunted perseverance that mark all noted inventors. He has already made several important contributions to the list of patented inventions. His improved water wheel was patented over a year ago by Messrs. Dewey & Co., of San Francisco, and is rapidly asserting its superiority over all others in use. Seventeen of these wheels are now running in Amador and adjoining counties. Among the mills run by Knight's wheel, we may mention the following: The Oneida, 60 stamps; the Consolidated Amador, 40 stamps; the Lincoln gold mining company, 40 stamps; the Keystone Consolidated, 40 stamps; and the Original Amador, 40 stamps. It is, however, in the adaptation of water power for hoisting works that Knight's reputation as an inventor will henceforth be known.

The Keystone Hoisting Works.

Some months ago the Keystone mining company determined to sink a new shaft to facilitate the working of their mine. The enterprising superintendent, O. C. Hewitt, whose readiness in adopting the latest improvements has made the Keystone the best equipped mine in the county, if not in the State, instructed Mr. Knight to construct first-class hoisting machinery over the new shaft, leaving him to determine as to the character of the works. Here was an opportunity to test his long-cherished theory of hoisting by water power, which in his own mind had already passed the theoretical stage and become an accomplished fact. He immediately set about the work without revealing the nature of his designs. It soon became noised abroad that he was trying to put up hoisting works to run by water, and the enterprise became the butt for the ridicule of every ordinary mechanic in the county. The idea was laughed at as absurd, and a complete failure was predicted. The engine and boiler makers were particularly incensed at the undertaking, which, if successful, threatened to curtail their business to an alarming extent. To

the credit of the superintendent of the mine be it said, that he remained undisturbed by these would-be prophets. He had faith in the ability of Knight to fulfill his engagement, and wisely refused to interfere in any way with his plans. About three weeks back the works were brought to completion, and everything worked to a charm. The whole machinery is as easily manageable as the steam engine. Every desirable point in the engine is retained by this novel water power. The hoisting and lowering is conducted with the same precision, and the speed regulated as readily as by the old method. The voice of opposition is silenced, and the laugh turned in favor of the inventor.

The Invention Explained.

During the week we have taken the trouble to visit the Keystone mine for the purpose of inspecting the contrivance, and will now proceed to explain its essential details as far as our limited acquaintance with the technical terms will allow. There are two water wheels, each four and one-half feet in diameter, both of Knight's improved pattern. One of these wheels is for hoisting and the other for lowering. The water is conducted through a 15-inch pipe, with a fall of 150 feet. Within a few feet of the wheels the pipe branches into two distinct forks, each wheel being provided with its own nozzle. To change the water rapidly from one wheel to the other without endangering the pipe is the point wherein the merit of the invention lies. To accomplish this, a simple but efficient device is brought into use for working the gates of the two wheels, to which gates the name of "power gates" has been given. Each gate is furnished with two cylinders, cast in one piece, and the small cylinder has two pistons acting as a balance valve. When moved by the engineer, a port hole is opened, which admits the water into the large cylinder, the water forcing back the piston and rod that pass through the cylinder end connect with the slide valve of the water gates. By this means the gates are moved almost instantly, and the flow of water can be graduated to insure the desired speed of the ascending or retreating bucket. The steam engine, used for hoisting before the water power was constructed, is still retained, so that hoisting may be carried on in the event of a temporary suspension of the water supply. It needs no change of position in the reverse lever to operate either by steam or water. The water wheel power is connected with the engine shaft by a large pulley and belt, and in running by water the connecting rod is simply disconnected from the engine.

The Importance of the Invention.

It is scarcely possible to over-estimate the importance of this invention to the mining interests of the foothills. One of the principal items of cost in mining is the expense of fuel for the generation of steam. The substitution of water for steam in running mill machinery, has already materially reduced the cost of mining. By this adaptation of water power for hoisting, steam can be entirely dispensed with. In the case of the Keystone, as soon as the new shaft is completed, all the hoisting will be done by this water power and steam will not figure in the operations at all. The water, after running the hoisting works, is again utilized in feeding the stamps. So that by and by the entire expense of hoisting by steam will be saved. Some idea can be formed of this saving, when it is said that about fifteen cords of wood are now consumed every day in running the engines of the Keystone, and that the cost of this fuel is equal to at least \$1 for every ton of ore taken from the mine. It will thus be seen that this reversible water power is destined to mark the dawn of a new era in the history of mining enterprise in California.—Amador Ledger.

THE BONANZA CONTRACT.—A contemporary announces the subjoined as the contract between the Government and Flood & O'Brien: The Consolidated Virginie and California mining companies propose to sell \$20,000,000 of Dore bars, to be supplied at the Carson Mint, and to take in payment the amount of gold contained therein, and five or four and a half per cent. bonde at market rates. The price of silver is to be governed by the London rate, less transportation from New York, plus the premium on exchange; deliveries to be commenced immediately, and to be completed by the Fourth of July.

THE Associated Country Press of the Pacific coast met on Monday at the Occidental hotel. This association represents 30 of our rural papers, and one of its main objects is to do away with "patent outsiders," and to obtain in their place the full benefit of all city advertising now sent to them in this wholesale fashion. The next day (Tuesday) Mr. Glancy, of Auburn, was chosen as their agent in this city, the appointment being left to the Directors. The association adjourned sine die.

RICH gold discoveries are reported from St. George, Utah, assays from the surface dust going as high as \$1,000 and \$1,500 to the ton. Brigham Young is on his way from Salt Lake to inspect the new fields, and if they are found to be of value, will call down a force of his adherents to keep out Gentile miners and prospectors.

THE present season has been very disastrous to the Southern Pacific railroad company, costing them over \$100,000 for repairs, principally owing to the shifting by the heavy rains of the sandy soil upon which the track is laid.

Snow is two feet deep on Mount Diablo.

The Mining Committee's Report on the Debris Question.

The report of the Committee on Mines and Mining opens with the statement that mining and agriculture are the chief industries of the State, and between them there is a condition of mutual dependency. Agriculture was called into existence in California by the necessities of the mining population, and now the larger part of farming produce is consumed at home, and of these consumers is the mining population, constituting one-fifth of the entire population.

History shows that a country which for years largely exports its cereals, impoverishes itself. Wheat is the only practical export for the farmer, and hence wheat chiefly is sown; but if one staple only is planted for many years, the result will be disastrous to farming interests. To foster mining, and increase the number of home consumers and establish a home market, encourages varied agriculture and enables rotation of crops to preserve the fertility of the soil. So, any act crippling mining, will, almost in the same measure, bring disaster to the farmer.

Gold Production.

The gold production of California from 1849 to December, 1875, is estimated at \$1,146,000,000, of which probably \$900,000,000 came from the ancient gravel deposits of the State, directly or indirectly. From 1849 to 1859 these fields were washed by placer mining. The great fertile plains of the Sacramento and San Joaquin were created by the soil and gravel washed by the slow processes of time from the mountains, while the gold was left in the streams for the pioneer miners. These placers being exhausted, in imitation of nature, the miner began with the hydraulic process, which has grown to be the most important mining interest in the State, and is now bringing renewed wealth and prosperity to many of our once famous mountain counties. About \$130,000,000 has been expended to date in canals, reservoirs, etc., for working gravel channels. The yield in 1875 from these mines, despite an unfavorable season, amounted to about \$12,000,000, and will increase in the next five years to \$20,000,000 per annum. Many large hydraulic enterprises are on the eve of becoming productive, and hence the foregoing estimate is just. This great yield represents an enriching capital of fully \$200,000,000, and will support 120,000 souls and indirectly assist the farmer, manufacturer and commercial dealer.

Water Held in Reservoirs.

The miners have large numbers of reservoirs, which are filled with water during the winter floods, to be exhausted in summer and autumn. Many large reservoirs are now being constructed and will help decrease the flow of water in the rivers in winter, and in aiding in a supply for navigation in the summer. The united storage capacity of these reservoirs will, within two years, amount to an increased stream during the dry season of fully 70,000 miners' inches, being a flow of 1,800 cubic feet of water per second. If this was used for irrigation it would bring into cultivation 350,000 acres of foothill lands. Should mining cease and the value of the mines be extinguished, the mining counties would be destroyed and all the taxable property in the state would be seriously diminished, and the tax rate thus raised to the whole people.

The Damage Done.

The debris has done much damage to farming lands in the Yuba and Bear river valleys, and incidentally to lands on the Feather and American rivers, and has filled up the bed of the Feather river, somewhat effecting its navigation.

Whether the Sacramento river has been injured is doubtful, and engineering only can develop the real facts in that case. The flood of 1861-2 caused the first considerable amount of damage, and since has been increasing until now 30,000 acres, perhaps, of arable land have been covered with detritus from the mines. The damage is judged to be not over \$3,000,000, estimating the land at the high price of \$70 per acre, and allowing a liberal sum for damage to Marysville. As the beds of the Yuba and Bear rivers increase in width, their future vertical increase in the height will be diminished, though the mining debris may be greatly increased.

The mountain canons receive the tailings first, and the amount carried down in solution becomes less and less, until at Sacramento, by experiments made by Dr. Logan, the proportion by weight of earthy matter is to the water as one is to 1,000. This would make by bulk about one to 200, and is less than is carried by many of the world's great rivers. Most of the sediment carried by the Sacramento and San Joaquin rivers is finally deposited on the mud flats of the Lower Sacramento and in Suisun and San Pablo bays. Its entire amount, excepting Dr. Logan's experiment as correct, would be represented by an annual deposit of one square mile filled eleven feet in depth.

Debris Useful for Fertilizing.

The Nile brings down in its waters about twice as much earthy matter, and by a judicious system of irrigation is nearly all deposited upon the fields of Egypt. This has resulted in increasing the vertical height of the fields of Heliopolis, near Cairo, about 60 feet, and to the fertilizing properties of this deposit is due the continued fertility of the Egyptian soil, which produces now as abundantly as it did in the days of Jacob.

Irrigating With Surcharged Water.

The experience of many mountain farmers

who have used for irrigation water charged with mining sediment, has fully demonstrated its fertilizing properties, and private corporations in Butte, Yuba and El Dorado now propose to irrigate mountain slopes with it to fertilize the soil, and are acquiring lands for that purpose. If the coarser tailings are confined to the mountain lands, and the finer tailings deposited on the low lands of the Sacramento, they would be raised, fertilized and protected from overflow. The erosion by running water of the western slope of the Sierra has already filled these low lands to their present elevation, and this proposed measure is simply an imitation

Commission of Engineers to investigate the whole subject. The committee therefore recommends a substitute for Assembly concurrent resolution No 17. The report is signed by Representatives Birney, Blue, Briceland, Dunlap, Crutcher, Griswold and Koutz.

The Oppenheim Single and Double Buggy.

The Oppenheim buggy, which we illustrate on this page, is a California invention just patented, and a very ingenious one at that. Its peculiarity consists in the arrangement of the



FIG. 1. OPPENHEIM BUGGY, ARRANGED FOR ONE SEAT.

of nature, except that it is proposed to do in a few years what nature would require centuries to accomplish by natural causes. All successful protecting levees on tule lands have been built of mining-washed earth.

What Can be Done—Suggestions.

The committee think some plan can be de-

seats, by which it can be instantly changed from a single seated buggy, as shown in Fig. 1, to a two seated rockaway, as shown in Fig. 3. The ingenious mechanism by which this change is accomplished is exceedingly simple in detail and adds no material weight to the vehicle.

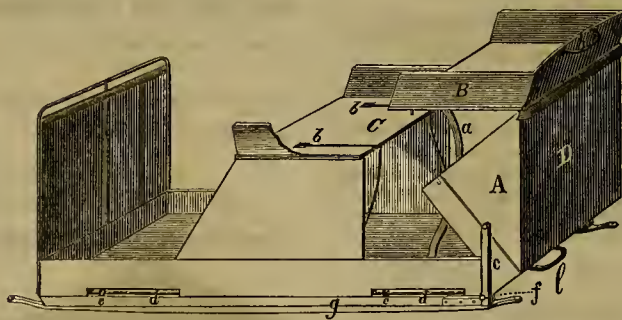


FIG. 2. DETAILS OF CONSTRUCTION OF OPPENHEIM BUGGY.

vised by engineering talent to prevent the damage complained of in a great measure, and so as to use the debris to the building up and reclaiming of now unproductive territory. The State and Federal Government should take action, says the committee, for the relief of those

There are, moreover, no unsightly bars or rods to support the movable seats, but everything is covered in, so that the general arrangement is neat, as such things should be. This is a great improvement over the so-called "jump seat" buggies, which have heretofore had such



FIG. 3. OPPENHEIM DOUBLE BUGGY AS A ROCKAWAY.

already damaged and now being damaged by mining tailing deposits upon their farms.

The committee further considers the vast importance of the subject, its relation to the prosperity of the country and its financial condition, and concludes by advising that Congress be memorialized for the appointment of a

a reputation for comfort and beauty.

The Single Buggy.

When arranged with but one seat, the vehicle is of no greater dimensions than an ordinary buggy, viz: 20 inches from dashboard to seat, 14 inches across the seat, 14 inches to rear end, making it four feet long in all, with no bars or

props sticking out behind. It then has the appearance shown in Fig. 1. In this form it is adapted to all the usual services required of an ordinary single seated buggy, but possessing the additional advantage of a capacity of enlargement at a moment's notice, in case more than two persons are to ride.

Operation in Making the Change.

To double the seats, the hind seat, B, (Fig. 2,) is lifted by the handle, h, from the front seat, C, into which it fits snugly (in the case of the single seated buggy), and pulled back as far as the stop joint, f, of the regulating bar, c, will permit. It then assumes the position shown in Fig. 2. Then the whole body is pushed forward by the lower handle, l, the body sliding on the bars, d, d, which pass through the rings, e, e, which are fastened on the supporting frame, g. By this means the front seat and dash are advanced 10 inches, while the hind seat, B, drops on to and is supported by the side panel, A. The buggy is then

A Two Seated Rockaway.

As shown in Fig. 3. The rockaway has all the proportions of a vehicle built expressly for two seats. The body is apparently lengthened 15 inches, by throwing the hind seat entirely behind the sill, where it is held firmly in position by the steel bars, a, a, as well as by the bars c, c, which latter also regulate the action when opening or folding the seats, and prevent the body from sliding backward or forward when in position. The length of the body is now as follows: from dashboard to front seat, 20 inches; front seat, 14 inches; space between the seats, 14 inches; width of hind seat, 15 inches; total, 63 inches. Both seats retain their full width, an important point, as the steel bars, a, a, drop into the grooves b, b, when the seats are folded. There is ample room for the knees and feet between the seats, and above all, it is as easy to get in and out of the behind as in front, a facility which no vehicle of this kind has offered until now.

Although this device may seem complicated from the description, at first glance, it is by no means so, being so simple in construction as not to be liable to get out of order, and if it should, any carriage maker or even blacksmith could repair it. By the slide motion of the body the weight of the seats is equalized, and either spring is relieved of too great a pressure, as would be the case if the seat merely dropped back without the body sliding on the frame. When arranged as a single buggy the seat comes back in its proper place, and when double the front seat is forward, so as to equalize the weight on the springs. The top is so adjusted as to be used as a single buggy top or extension top at pleasure, or the buggy can be built with the so-called stationary top. Livery stable keepers will easily see the advantages of a vehicle of this sort, as will those who do not desire to keep two buggies, but sometimes need a single, sometimes a double buggy. The Oppenheim buggy as made at present weighs about 400 pounds, without the top, and the price does not much exceed that of an ordinary single seated vehicle. Those desiring further particulars can apply to the agent, E. Steele, 13 Merchants' Exchange, in this city, or M. T. Holmes, the manufacturer, on Sutter street, near Stockton.

Bonanza Mines.

It will be remembered that about a year ago the proposition of cutting up the stock of the Consolidated Virginia mine was discussed, and there was a strong power in favor of taking that course, but finally the consideration of the question was postponed. It has now come up again and is definitely decided on. The increase of stock will be five of the new shares for one of the old. The capital will then be \$54,000,000, and the dividends per share will be paid in proportion. If anybody wants to buy any bonanza he will have a better chance now than when a single share was worth \$490.

Hale & Norcross is to be divided up seven for one, which will bring another low priced stock. The Consolidated Virginia is yielding at the rate of \$100,000 per day. The Mexican has developed not only a fine prospect of rich ore at the south end, but also struck good milling ore in the bottom of the winze, on the north line, 50 feet before reaching the 1465-foot level, which looks as if a rich and continuous body of ore the full length of the mine was going to be found. The Sierra Nevada has just opened a station and commenced the development of the ledge at the 1500 foot level, a point on the ledge that must be looked to with deep interest for some time to come.

MINING DITCHES.—Hilburn's bill, introduced in the Senate, provides that all water companies organized for the purpose of furnishing water for mining purposes must supply without distinction or discrimination all persons operating mining claims along the line of or adjacent to the ditch, flume, pipe or aqueduct through which water is supplied to customers to the extent of their capacity to so furnish the same, and at their regular schedule of rates. Any company refusing to supply a proportionate quantity of water to any person entitled thereto shall, upon tender of payment therefor, be liable to such person in damages to treble the amount of the sum so tendered.

MINING ENGINEER.—Attention is called to a new advertisement of a mining and civil engineer of over 20 years' experience in the United States, who has recently taken up his residence with his family on this coast.

(Continued from Page 182.)

this work, it may be stated by way of preface that the ores here occur mostly in large and regular fissures, the latter running along the steep mountain side generally parallel with each other and not far apart. Under this arrangement it becomes possible to cut off at great depth a considerable number of these lodes by means of a comparatively short tunnel run at right angles with their course. Availing themselves of these conditions, the above company, who are large owners in the principal series of lodes here, determined to commence an adit of this kind, the veins to be intersected by it consisting of the Buena Vista, lying further up the mountain, followed by the Union, San Felipe, Omega, Santa Maria, Jefferson, Cainan, Guadalupe, Guaymas, First and Second lead mines, San Benito, Alpha and Ignacio. These are all broad, well-defined, fertile ore channels, easily traced in a linear direction for a long distance, each of them having a number of different company claims located upon them. The Potosi own portions of nearly all the more valuable of these lodes, besides having interests in mines situated elsewhere in the district. These lodes occupy a belt less than 3,000 feet in width extending north and south along the face of the mountain, here so steep that the tunnel will be 2,140 feet below the surface when it reaches the Buena Vista lode, and 300 when it reaches the Ignacio, the first lode cut, unless a blind one should be sooner encountered, the entire tier of veins being intersected at an average depth of about 860 feet. This tunnel was commenced several months since, and has now reached a length of over 500 feet, the work of excavation having thus far been performed by hand. To facilitate its progress, a machine drill of the Burleigh patent has been purchased at a cost of \$15,000, and will soon be in operation, through the aid of which it is expected the tunnel will be completed in a year from the time the machine is started. This adit is 8 feet high and 10 feet wide, and will cost about \$100,000.

Advantages of the Tunnel.

In few localities would a work of this kind secure greater benefits to both the proprietors and the adjacent mine owners than here. Many of the lodes in this belt have now been worked by means of shafts to depths varying from 500 to 700 feet, as far down as operations can be prosecuted without costly hoisting works. The slope of the mountain above the mouth of the tunnel is steep, rendering it difficult to get the ores down if brought to the surface through shafts, whereas the ground below is so flat that they could be easily removed. By drifting in on the tunnel, the companies owning on this belt would be able to attack the veins down where the richer ores are supposed to exist, the deposits here having been found to improve downward in a remarkable manner. By working through this adit all the cost of drainage and of hoisting their ores, and afterward bringing them down on the surface, would be avoided, not to mention other material gains effected. The proprietors of this tunnel will in fact be able to largely control this belt of mines. All blind lodes cut they will take as a matter of course, and of these a good many will most likely be encountered. Several have already been met with, two of them carrying ore of astonishing richness. No competing tunnel can be run, for the reason that this company have secured the only eligible site here. All claim owners interested have concluded to get along with their present shafts and inclines until the big tunnel is completed, and then work through it, paying a moderate royalty for the privilege. A considerable body of water was recently struck in this tunnel, and as this has heretofore been a scarce article in Cerro Gordo, selling at high rates, this abundant flow must yield the company a handsome revenue, the probability being that the supply will increase as the tunnel is advanced.

The Character of Ores, Cost of Freight, etc.

The ores in this district consist of carbonate, sulphureta, and the chlorides of silver, with large quantities of argentiferous galena. Both the milling and smelting ores are extremely tractable. The former carry from \$150 to \$500 per ton of silver and \$90 of lead, the lead more than covering the cost of milling, smelting, and transporting to market. The geological formation here is composed mainly of alternating bands of slate and limestone, being favorable alike to permanence and wealth. The cost of freight bullion to San Francisco is now \$50 per ton—rates, as the railroad approaches, being steadily diminished. In the course of a year or two this district will probably be connected with tide-water by means of two railroads. For an enterprise combining so many of the elements for success and as well administered, a very prosperous future may reasonably be expected. The finances of this company are in a healthy state, and its business affairs in excellent hands. As a mining captain, John Simpson, having charge in the field, has no superior; while it may safely be said that what Jaa. A. Pritchard, President of the company, does not know about mines and mining matters has not yet been found out by any one else. With a tunnel designed to secure so soon the deep development, ventilation, and drainage of this important group of mines, and with railroad transportation to tide-water so close at hand, the prospects of Cerro Gordo and the mining districts adjacent are of an altogether encouraging kind.

Rich mines have been discovered in Big Horn and Owl Creek mountains, Wyoming.

Quartz Mining in Montana.

Every day brings reports from the quartz mining districts of improved prospects in the lodes, and indications of increased activity in this important branch of mining industry during the coming season. From Bannack, Trapper, Vipond and Butte we hear cheering news, and are assured that if but a tithe of the present expectations are realized, that there will be a large augmentation of the yield from our gold and silver mines, and that another year will see the demonstration of the fact that Montana possesses mineral-bearing lodes in no whit inferior to those of the chief hulkion producing States and Territories. Already the shipments from Phillipsburg are marvellous, compared with the former yield from the mines in that region, and in a short while their producing capacity will only be limited by the facilities for treating the ore as they are extracted from the mines. The failure of the past have brought experience—dearly bought, perhaps, in many instances—and this virtue, which is proverbially said to "make fools wise," combined with energetic effort, will place our quartz minea in their true light, and develop the hidden wealth in our mountains. Steady, persistent labor, aided by judiciously invested capital, are bringing to the light minea of wealth which would gladden the eyes of the most sanguine prospector, and we speak by the card when we say that the future of Montana, as a mineral-producing region, never appeared more bright than it does to-day. With the almost daily discovery of mines, and their successful working to encourage us, what may we not predict of the results of quartz mining in Montana in the near future?—*Montanian*.

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HALE, PAGE & WILSON,
Commission Stock Brokers, 429 California Street, S. F.
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The undersigned, owners of LESCHOT'S PATENT for DIAMOND POINTED DRILLS, now brought to the highest state of perfection, are prepared to fill orders for the IMPROVED PROSPECTING and TUNNELING DRILLS, with or without power, at short notice, and at reduced prices. Abundant testimony furnished of the great economy and successful working of numerous machines in operation in the quartz and gravel mines on this coast. Circulars forwarded, and full information given upon application.

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San Francisco Cordage Company. Established 1856.

We have just added a large amount of new machinery of the latest and most improved kind, and are again prepared to fill orders for Rope of any special lengths and sizes. Constantly on hand a large stock of Manila Rope, all sizes; Tanned Manila Rope; Hay Ropes; Whale Line, etc., etc.

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WIRE ROPE

For Mining, Shipping, and General Purposes.

All kinds and sizes on hand, or made to order; guaranteed of unsurpassed quality, and manufactured of any length. FLAT ROPES, ROUND ROPES and TAPER ROPES, OF IRON OR STEEL.

Patent Endless Wire Ropeway

(WIRE TRAMWAY)

FOR THE RAPID AND ECONOMICAL TRANSPORTATION OF ORES AND OTHER MATERIAL OVER MOUNTAINOUS AND DIFFICULT ROADS.

This system has been in use for over three years and given thorough satisfaction.

PATENT GRIP PULLEY,

For transmission of power by means of wire ropes

WIRE.

Fencing Wire and Staples,
BALING WIRE,
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And Wire of all kinds, on hand or made to order.

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Richard Johnson and Nephews' Celebrated Telegraph Wire.

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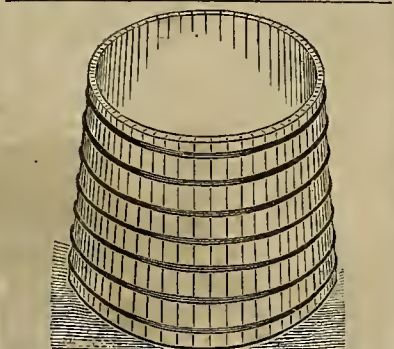
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G. & H. BARNETT,
Manufacturers of Files of every Description
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Sold by all the principal hardware stores on the Pacific Coast. 18v25-1y



WATER TANKS of any capacity, made entirely by machinery. Material the best in use; construction not excelled. Attention, dispatch, satisfaction. Cost less than elsewhere.

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Mechanics' Mills, Cor. Mission & Fremont Streets
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Removed to 32 Fremont Street, near Market.

J. W. QUICK,
Manufacturer of perforated sheet metals of every description, at reduced rates. Mill owns a Mining Battery Screens extensively, can contract for large supplies at favorable rates. This is the only establishment on the Coast devoted exclusively to the manufacture of Screens

Metallurgy and Ores.

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IMPORTERS OF AND DEALERS IN
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Chemical Apparatus and Chemicals, Druggists Glassware and Sundries, etc.

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Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast. Our Gold and Silver Tables, showing the value per ounce Troy at different degrees of fineness, and valuable tables for computation of assays in Grains Grammes, will be sent free upon application.

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Nevada Metallurgical Works,

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Ores worked by any process.
Ores sampled.
Assaying in all its branches.
Analysis of Ores, Minerals, Waters, etc.
Plans furnished for the most suitable process for working Ores.
Special attention paid to the Mining and Metallurgy of Quicksilver.

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COMMISSION MERCHANTS,

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Instructions in Assaying,

Chemical Analysis, Determination of Minerals, and use of the Blow-pipe.

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QUICKSILVER FLASKS,

Tested to 1,000 lbs. per Square Inch,

For Sale in Lots to Suit, by

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SAN FRANCISCO CAL.

7v21-3m

OF INTEREST TO

MINING COMPANIES.

A Mining and Civil Engineer, of long experience, collected in Europe and America, well acquainted with correct management of mines and mills, practised in projecting and constructing mining and milling machinery, and especially machinery for mechanical ore concentration, is open for re-engagement, and would prefer the task of constructing works for mechanical concentration of low grade ores on a well developed mine, or of remodeling ineffective works in the ore milling line for successful operation. Apply to Messrs. DEWEY & CO., of this office, for reference.

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SOLE AGENT FOR THE PACIFIC COAST FOR

J. A. Fay & Co's Wood-working Machinery,

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Tanite Co's Emery Wheels and Machinery,

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Sturtevant Exhaust Fan for Removing Shavings and Sawdust from Machinists.

Sturtevant's Blowers and Exhaust Fans,

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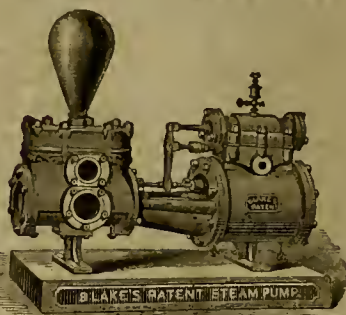
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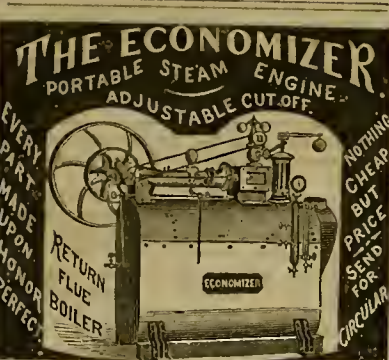
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BLAKE'S PATENT STEAM PUMP



Over 8,500 in Successful Use in the United States.

Machinery.



THE ECONOMIZER PORTABLE STEAM ENGINE. ADJUSTABLE CUT-OFF. EVERY PART MADE UPON PERFECT PRINCIPLES. NOTHING BUT CHEAP PRICES FOR CIRCULAR.

A. L. FISH & CO.,

Sole Agents for California, 9 and 11 First Street, - - San Francisco.

Buffalo Excelsior Pony Planer & Matcher.



Excelsior



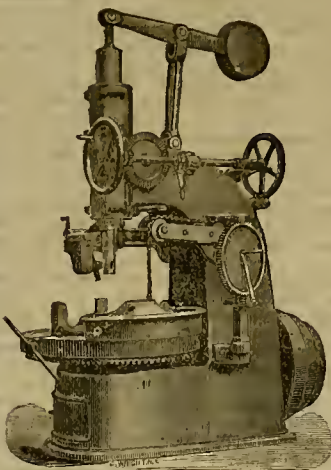
Scroll Saw.

Saw only without attachments, \$9.



BUFFALO PONY PLANNER.

DUNHAM, CARRIGAN & Co., San Francisco, are Sole Agents in California for my Heavy Wood Working Machinery.



No. 4 Car Wheel Borer.



We have the best and most complete assortment of

Machinists' Tools

In the Country, Comprising all those used in

MACHINE, LOCOMOTIVE, AND R. R. REPAIR SHOPS.

For Photographs, Prices and Description, etc., address

NEW YORK STEAM ENGINE CO., 98 Chambers Street, New York.

CANDLES.

MITCHELL'S

New York Candles

Full Weight and 14 ounce.

Will be found on comparison to be

Unequalled in Quality.

14 GMG OZ.

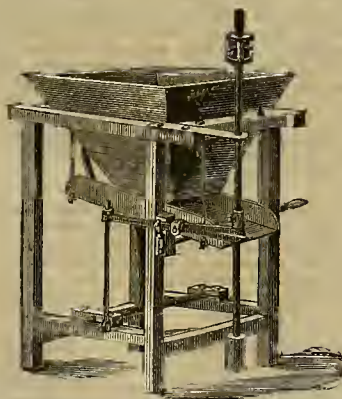
STEARIC ACID CANDLES GEO. M. GRANT & CO. PHILADELPHIA.

FOR SALE BY ALL THE LEADING JOBBERS.

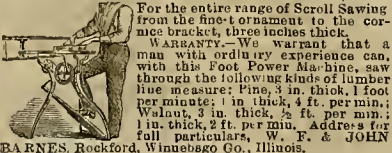
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TULLOCH'S AUTOMATIC ORE FEEDERS

Increase the Capacity of each Battery Two to Three Tons per day.



Barnes' Patent Foot and Steam Power Scroll Saws and Lathes.



BARNES, Rockford, Winnebago Co., Illinois.

SAVE LABOR! SAVE MORE GOLD! SAVE SHOES AND DIES.

One Man Can Attend to a Hundred Stamps.

WILL FEED ANY KIND OF ORE. WET OR DRY.

ARE DIRECT ACTING. EACH MOTION SCRAPES A PORTION OF THE ORE INTO THE BATTERY. CAN REGULATE THE FEED. ARE SIMPLE AND DURABLE. ARE IN USE IN CALIFORNIA, NEVADA, IDAHO AND MEXICO. WARRANTED TO WORK.

F. OGDEN, Sole Agent,

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STEAM ENGINES & BOILERS

From 3 to 75-horse power. Shafting, Pulleys, Hoist Gears, Quartz Mills, Water Tanks, Spanish Aras, Pumps and Pipes, Hoop and Solder Pans, and all kinds of Machinery for sale at lowest prices by

THOS. P. H. WHITELAW,

266 Brannan street, S. F.

Highest cash prices paid for all kinds of Machinery.

The Ingersoll Rock-Drill



Is Extensively Used in the East and

TAKES THE PLACE OF ALL OTHERS, Wherever introduced, because it can be run with less power, labor and repairs, and do more work than any other Drill in the market. It has but few parts, is easily handled, being light, and HAS AUTOMATIC FEED, which saves labor. WE ASK FOR TRIAL AGAINST ANY COMPETITOR. For particular information regarding Drills or Air Compressors, send for circular to

J. B. REYNOLDS,

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STEEL SHOES AND DIES

FOR QUARTZ MILLS.

Made by our improved process. After many years of patient research and experiment we have succeeded in producing STEEL SHOES AND DIES for



Quartz Mills, which are unequalled for Strength, Durability and Economy.

Will wear three times longer than any iron Shoes.

BUILDERS AND CONTRACTORS

Of Quartz Mills, Pans, Separators, Concentrators, Jigs, Hydraulic Rock Breakers, Furnaces, Engines, Boilers and Shafting, and General Mining Machinery in all its details, and Furnishers of Mining Supplies. All orders promptly filled.

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Examination solicited.



From year to year they have been improved under the personal supervision of Mr. Hoadley. The latest great improvement is the REGULATING CUT-OFF, with balanced valve, thus giving it all the economy and increased power of the most thorough-built Corliss Stationary Engine. By this addition, a 15-horse power Hoadley Portable can be run at over 40-horse power, if required. As a Threshing Engine, the Hoadley is the leading engine of the country. It has no equal. For prices, etc., send to

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E. B. Smith, for nearly twenty years engaged in the direction of mines and mining enterprises, can be engaged to take charge of any legitimate mining enterprise. Mr. Smith thoroughly understands the "Sonora" process of chlorination and lixiviation, being the originator of the same, and the erection of all machinery and furnaces for the treatment of rebellious ores. Office—439 Bush street, S. F.

(Continued from Page 181.)

progress, the water at the bottom no longer giving any trouble whatever.

ELY DISTRICT.

LOCAL MATTERS.—Pioche Record, Mar. 6: The amount of bullion shipped from Pioche during the month of February was \$180,980.98, a little less than for the month of January. This is accounted for by its being a short month. The Alps mill and mine continue to make good returns, having turned out \$13,000 in bullion this past week. The American Flag mine is running night and day with fair success. The repairs to the mill are almost completed and it is expected it will start up about the 6th of this month. The pump of the Raymond & Ely is still working successfully and running eight strokes per minute, keeping the water at a low stage. On Friday the pump was stopped for eight hours to enable them to put in a plunger. When the pump commenced work again there were 50 feet of water in the shaft, which will doubtless be reduced by this morning to three or four feet. Work in the mine is continued vigorously on the 8th, 9th, 10th and 11th levels. The Nevada Central railroad is conveying the usual amount of ore to the mills at Bullionville and the bullion yield shows improvement.

RAYMOND AND ELY.—Work is steadily proceeding with on the 8th, 9th, 10th and 11th levels of this mine, the 11th being pushed ahead rapidly. The amount of ore extracted comes up to the usual average, 75 tons. The various levels are looking well and show no decrease in the ore. The pump is giving satisfaction in every particular.

AURE MINE.—The production of bullion at this mill last week amounted to \$13,000. Ten stamps were run on ore from the Alps mine and for the last three or four days the other five stamps have been run on custom ore. The above returns show that good work is being done.

NEWARK MINE.—This mill during the past week has been busily engaged running on chlorides' ore from the Meadow Valley mine. Among the shippers are Ed. Boyle and Joe Kennedy.

TYBO DISTRICT.

THE TIMES.—Oor. Eureka Sentinel, Mar. 9: Our late heavy snows have rendered the burning and hauling of coal almost impossible, in consequence of which our furnace has closed down. About the 20th inst. the new 60-ton furnace will be completed, when the company contemplates starting it. It thinks that from that time on it will be able to procure sufficient coal to run at least one furnace all the time. Our little burg is considerably agitated at present on the subject of Chinese labor. Some of our heavy coal contractors are thinking of employing them. There are no doubt men who can be worked to a much greater profit than white men; but while it will enrich individuals, whether it will impoverish the mass of workmen is the question to be decided. It is rumored here that there is a society formed by the miners and coal-burners, comprising 75 members, to prevent the introduction of Chinamen as coal-burners. We do not entirely approve of them taking away the work of our countrymen, still the arbitrary measures which some propose taking to prevent it are to be severely denounced. It is adopting crime to prevent an evil. Our mines—the 2 G and Bunker Hill—are looking better than ever. Working them has only disclosed larger and richer bodies of ore, and enhanced their value. The hoisting works on the large shaft of the 2 G have been found to be too light and insufficient for the work, so the company will shortly place new and heavier machinery in their place.

Taz Gila mill, at Revella, has closed down, it is said, for lack of ore. But where nobody is admitted to a mine it is difficult to tell what they have in it. They have produced too much bullion already to stop entirely now.

Our latest news from Belmont represents that town to be in a fever of excitement over the wonderful strike in the South Barcelona mine, at Spanish Belt district. It is said that they have run into a body of \$600 ore in the tunnel, and that they are now into it 45 feet without any sign of a foot wall. We can deduct a good deal from this for exaggeration's sake, and still have a big thing. There is no doubt they have struck a bonanza.

Oregon.

VIRTE MINE.—Bedrock Democrat, March 1: On last Monday we, as well as a large number of our citizens, visited J. W. Virtue's bank to see and lift the bullion from the Virtue mine, and the result of 15 days' run of the Virtue mill from the rock that is now being taken from the mine. The bullion weighed 664 ounces and is worth \$12,616. The longer this mine is worked the better it proves itself to be. Superintendent Hyde understands his business thoroughly, and has brought the work to such a regular system and to such perfection that the same amount of work is done with one-third less labor than the same formerly required. The new working shaft has reached a depth of 175 feet, and is being pushed ahead as fast as possible; another contract will be let as soon as the present 100-foot contract is completed. The new shaft, if completed, will make the work will be very much facilitated, and larger bullion shipments will be the order of the day. Lumber is being landed now for a new shaft house, and new hoisting machinery will be put in position immediately. The machinery is all on the ground.

Utah.

STAR DISTRICT ITEMS.—Oor. Salt Lake Tribune, March 2: Since my last, the Big Bonanza in San Francisco district has changed hands. The lucky purchasers are Matt Cullen, Denney Ryan, Green Campbell and A. J. Ryan. The price paid, I am informed, is \$25,000. A small price for so nice a piece of property. There are also a number of other prospects in the district which are yielding ore, and looking finely. Among them is the Battler. A good body of ore has been struck, and the owners are happy. Mr. Schappell and Mr. Martin, of Beaver City, have lately purchased a claim known in this district as the Longevity. It is now being fed with miners, powder, drills and other useful articles. Pure ore is light and it looks well. They have also purchased a half interest in the Self Riser, and the way ore of a high grade is being raised, it is not misnamed. Many other prospects are being worked and look well. A smelter is to be erected near the Big Bonanza, in San Francisco district. This, with the smelter at Troy and Shantree, makes three. Lincoln district now severely feels the need of a railroad. The machinery for the big mine there has now been on the road for a long time, and work is at a standstill in consequence of it. The mines and prospects in and around here look so encouraging that the Black Hills fever has removed, but very few from our midst.

BRADSHAW DISTRICT.—situated about four miles south of Lincoln, is becoming one of the leading ore-producing districts of Beaver county, and its mines are being developed by their owners, and are proving to be of great value. The formation of this district consists of limestone, quartzite and granite, and the mines of the same show quantities of milling and smelting ores, the former character of ore predominating as far as developments have been made. The milling ore goes about \$300 a ton, and the gold, carrying but a small percentage of lead. The ore of the Cave mine, which is the oldest location in the district, and which has been developed to a considerable extent, shows in all its drifts, inclines and shafts, a large body of milling ore, carrying chlorides, some horn silver and gold.

SEVERAL ore mills in the vicinity of Gold Hill and Silver City have been compelled to suspend operations on account of scarcity of wood and the bad condition of the roads.

PATENTS & INVENTIONS.**A Weekly List of U. S. Patents Issued to Pacific Coast Inventors.**

FROM OFFICIAL REPORTS FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.]

By Special Dispatch, Dated Washington D.C., Mar. 14th, 1876.

FOR WEEK ENDING FEBRUARY 29TH, 1876.*

ELECTRO-MAGNETIC REGULATORS FOR STEAM ENGINES.—Stephen D. Field, S. F., Cal.

ELECTRICAL SWITCHES AND CUT OUTS.—Stephen D. Field, S. F., Cal.

SADDLE TREE (papier mache and cork dust).—Pemberton B. Horton, S. F., Cal.

WHEELS FOR VEHICLES.—Charles Lea, Florin, Cal.

ADJUSTABLE MOLD BOARD SCRAPER.—Frank O. Millikan, Santa Cruz, Cal.

VEHICLE SEATS.—Frederick Oppenheim, S. F., Cal.

CLOTHES LINE.—Lorenzo Sweet, S. F., Cal.

SHOES.—Hippolite Von Haverbeke, S. F., Cal.

QUARTZ MILLS.—Samuel H. Cowles, Sacramento, Cal.

ROTARY CULTIVATOR.—George E. Hopkins, W. T.

*The patents are not ready for delivery by the Patent Office until some 14 days after the date of issue. NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency, the following are worthy of mention:

PROCESS FOR PRESERVING THE WOOD OF MANUFACTURED IMPLEMENTS.—Charles Lea, Florin, Sacramento county, Cal. This invention relates to an improved device for securing a permanent saturation of the wooden portions of tools, implements and machines with oils or other liquid preserving agents, so that the wood will be both preserved and prevented from shrinking and swelling. The invention is specially valuable for preserving the wood work of wagon and carriage wheels. The inventor makes a groove or channel in the face of the piece of wood, which extends its entire length, and this groove or channel is filled with oil or other liquid wood preserving agent. He then covers the groove by securing a metal plate over it to prevent the escape of the oil. In the construction of wagon and carriage wheels, in order to preserve the wooden felloe and prevent it from shrinking and swelling, the groove is made in the face of the felloe so as to extend entirely around the wheel. The tire is then shrunk on over the felloe so as to make a perfectly tight fit all around. A hole can then be drilled through the tire so as to communicate with the groove, through which it is filled with oil, after which the hole is stopped up with a plug. The hub is preserved by making a groove around each end underneath the bands, and filling them with oil. By boring a hole from the bottom of the groove on the felloe centrally through each spoke, the spokes can be supplied with preserving liquid.

IMPROVEMENT IN SHOES.—Hippolite Von Haverbeke, S. F. This is an improvement in the construction of gaiters and consists in the combination with such a shoe of an elastic piece, which is fitted across the instep. In this class of shoes it is almost always necessary to alter the buttons where the shoe crosses the instep, in order to fit them to different forms of feet, and even when fitted new shoes are apt to make the feet sore. In these improved shoes an elastic piece of webbing is fitted into the upper of the shoe, just at the point where the part which surrounds the ankle meets the upper of the shoe in front, and this web extends a short distance past from the lowest point of union of the two, so as to cover the overlapping lower ends of the part which covers the ankle. The buttons are set on above the webbing in the usual manner. By this construction the shoe is easily fitted to any foot, whether the instep is high or low, and will always be easy to wear. A considerable saving is effected in cutting the uppers by leaving off the points which would be necessary if the webbing were not used.

CLOTHES LINE ELEVATOR.—Lorenzo Sweet, S. F. The object of this invention is to provide a device for making a small space available for the purpose of drying clothes, and it consists in the employment of a series of transverse or other frames, suitably guided so that by means of pulleys and cords, and an operating windlass, the lines can be elevated successively as fast as filled, and to any desired height. By this device the inventor utilizes a very small space of yard room to dry all the clothes which may be necessary, and the operation will be very easy, as the upper line being stopped at a suitable

height above the ground can be filled with clothes, then elevated out of the way, at the same time bringing the second line or lines to the proper height, and thus all the lines may be filled successively.

ADJUSTABLE MOLD BOARD.—F. C. Millikan, Santa Cruz. This invention is a peculiar construction of scrapers, principally useful as a scraper for leveling off ground which is composed of alternate knolls and hollows, where one part will be too dry and the other too wet to make a crop. It consists in the use of a frame having a scraping mold board which is provided with a mechanism which is rendered easily adjustable so as to stand at any angle and scrape deep or shallow, or discharge its load at will.

Gems and Precious Stones.

[Written for the PRESS by HENRY G. HANES.]

(Continued from last week.)

(7.) **Magnetism.** There are only three elements which attract the magnet, iron, nickel and cobalt, but these metals are contained in so many minerals that the test of magnetism is often a useful one. Some minerals only attract the magnet after being heated. A small magnet will serve nearly all the requirements of the mineralogist, but a delicate magnetic needle is best adapted for minerals possessing this property in a slight degree. The needle should not be strongly magnetized. Every mineral possessing magnetism will attract the north pole and repel the south.

(8.) **Optical properties.** When a ray of light passes obliquely through a transparent substance, its course continues the same as long as the substance has the same density, but should it enter a medium of different density, its course will be changed. This property is called refraction.

Some minerals have the remarkable property of producing double refraction; a line or other distinct object appears double when seen through a crystal possessing this property. This peculiarity was first observed in Iceland spar. Some minerals which refract light doubly, are of such a nature that the double figures cannot be easily observed. The following experiment may be tried in such cases: Make a small orifice in a card, place the card on the side of the crystal most remote from the eye, and observe the light of a distant lamp; the double image will be distinctly seen. Double refraction is not destroyed by the lapidary's cutting.

(9.) **Iridescence.** This appearance of a mineral must not be confounded with the changeable colors of others. The former is named from the rainbow. We have no word in English which exactly expresses the idea conveyed by the French expression, *chatoyement*, which alludes to the peculiar shining colors which appear in the eye of a cat in the dark.

A mineral is said to show changeable or chatoyant colors, when different sets of colors appear or disappear as the position of the specimen is varied.

The colors are said to be iridescent, when they do not change, but have the rainbow colors, being produced by the same natural laws.

(10.) **Color.** Although the color of minerals is sometimes striking and noticeable, yet it is seldom characteristic, the same mineral species often being found of different colors. When it was customary to describe minerals minutely, before they were classified by their chemical character, every possible shade of color was regarded and described, and formed a prominent feature in the descriptions. In Cleaveland's Mineralogy, published in 1816, once a standard work on the science, 77 shades are used in describing minerals, as follows: White, 8 shades; gray, 8; black, 6; blue, 8; green, 14; yellow, 12; red, 14; brown, 7.

(To be Continued.)

A NOVEL AND USEFUL PATENT.—There has been patented through the MINING AND SCIENTIFIC PRESS Patent Agency a device for amalgamating pans and settlers, whereby they can be practically "cleaned up" without ever stopping the machinery. Not only this, but the amalgam is deposited in a safe, and under lock and key and can only be handled by the party authorized. The patentee is Mr. Almarin B. Paul, inventor of the system for reducing and amalgamating gold and silver ores known as "Paul's dry process." We shall shortly describe this new device in detail.

A. W. LAUGHLIN, of the Denver Farmer, and A. W. Merrick, of the News, have started for the Black Hills with a printing press, type and all the paraphernalia of a newspaper office, and will establish the first paper in that region, at Custer City or Hill City, with the name of the *Black Hills Pioneer*.

C. Schindl, of Mokelumne Hill, picked up a piece of gold worth \$40 in his lot, a few days ago, the nugget having been unearthed by the action of the water obtained by bailing out his well.

TWENTY-THREE sacks of Gladiator ore from Boulder, Colorado, was recently sold in Golden at the rate of \$4,000 a ton, the highest price paid for samples of the lot being \$8,000 per ton.

New and powerful pumping machinery, of the same patterns as that ordered for the Savage and Gould & Curry, has been ordered for the Hale & Norcross mine also.

General News Items.

THE Bank of the State of New York has suspended.

JAPAN has formally declared war against Corea.

A TUNNEL through Russian hill in this city is proposed.

THEY are having a printers' strike in New York.

MRS. BELKNAP is to be subpened by the House committee.

THEY are having severe rainstorms in England and Scotland.

THE snow blockade still interferes with travel on the overland road.

DR. PARDEE was elected Mayor of Oakland at the election this week.

THE Wall street king, Daniel Drew, has gone into voluntary bankruptcy.

THEY had a very destructive gale on the English and French coasts this week.

JUNIOR TART, the new Secretary of War, has assumed the duties of his office.

CAPT. W. N. DEHAVEN, editor of the Chico Enterprise, died on the 11th inst.

THE Senate Committee reported against the passage of the Archer fare and freight bill.

THE Consolidated Virginia mine is turning out bullion to the amount of \$100,000 per day.

SILVER is in demand in London, the supply being limited. Bars are very firm, at 53½ pence per ounce.

THE treaties between the Argentine republic and Brazil have been ratified and all difficulties now terminated.

IT is officially announced that the German squadron in Chinese waters will be considerably reinforced for the suppression of piracy.

AN association entitled the Sportsman's Club of California, having for its object the protection of game and fish, has been established in this city.

A MAJORITY in the House Committee on Indian Affairs agreed to report a bill transferring the Indian Bureau to the control of the War Department. The minority will protest.

THE Pacific Mail steamship company has issued a circular by which it is shown that the earnings of the company for the past year amount to \$11,950,000.

THE jetty system of improving the mouth of the Mississippi river seems to be successful, vessels drawing 19½ feet of water having gone to sea through the jetties at Southwest pass.

IN regard to the shower of flesh in Kentucky, Prof. Smith, the scientist, says, in his analysis of specimens examined by him: "In my mind, this matter gives every indication of being the dried spawn of batrachian reptiles, doubtless that of the frog. They have been transported from ponds and swampy grounds by currents of wind, and have ultimately fallen on the spot where they were found."

New Incorporations.

The following companies have filed certificates of incorporation in the County Clerk's office at San Francisco:

POTOMAC M. CO.—March 12th. Location: Nevada. Capital stock, \$11,200,000, in 112,000 shares of \$100 each. Directors—A. J. Ralston, Jos. Marks, Russell J. Wilson, John Crockett and S. B. Smith.

CHOLAN M. CO.—March 12th. Location: Nevada. Capital stock, \$11,200,000, in 112,000 shares of \$100 each. Directors—A. J. Ralston, Jos. Marks, Russell J. Wilson, John Crockett and S. B. Smith.

MINOR M. G. & S. M. CO.—March 14th. Location: Gold Hill. Capital stock, \$5,000,000. Directors—John D. Jennings, Albert Heath, F. Adams, A. C. Hammond and H. E. McKinney.

TABOR M. M. CO.—March 14th. Location: Storey county, Nev. Capital stock, \$10,000,000. Directors—George Benson, Nathan Atkinson, Martin Jones, J. E. Jewell and J. F. Neesmith.

WESTERN MANUFACTURING CO.—March 14th. Capital stock, \$1,000,000. Object: To do a general manufacturing business, to manufacture and deal in all kinds of goods and merchandise, to buy and erect factories, etc.

Directors—H. R. Mann, D. L. McDonald, Saml. Sachs, A. D. Carpenter and C. R. Greathouse.

Meetings and Elections.

WEST POINT G. & S. M. CO., Gold Hill, March 14th. Trustees—J. J. Holmes (President), T. J. L. Smiley, R. H. Rogers, G. R. Varon and H. H. Flagg. David A. Jennings was re-elected Secretary.

PIONEER M. CO., March 13th. Trustees—J. C. Fall (Superintendent), F. H. Crater, R. E. Brewster, G. G. Berry (President), R. E. Brown (Secretary).

CONS. ALABAMA M. CO., March 14th. Trustees—M. McDonnell (President), J. H. Lovejoy (Secretary), J. L. Trask, R. L. Tracy, F. Mudge, E. A. Edwards.

To Mining Companies.

A Mining and Civil Engineer of long experience, well acquainted with the superintendence of mines and mills, the projecting and construction of hydraulic works, machinery, etc., is open for re-engagement. Apply to Messrs. Dewey & Co., of the MINING AND SCIENTIFIC PRESS, 224 Sansome street, San Francisco, for reference, or to J. B., Postoffice Box 683, Oakland, Cal.

VOLUMES of testimony in favor of HALE'S HONEY OF HORSERADISH and TAB, as a specific for throat and lung diseases, are pouring in from all parts of the country. Pike's Toothache Drops cure in one minute.

WOODWARD'S GARDENS embraces an Aquarium, Museum, Art Gallery, Conservatories, Tropical Houses, Managers, Seal Ponds and Skating Rink.

IN remitting cash to this office, do not send us checks on interior banks, as we generally have to return them by express for collection.

The Golden Sun Gold Mining Company.

Location of principal place of business, San Francisco, California. Location of works, Forks of Route Minn.

Notice is hereby given, that at a meeting of the Board of Directors, held on the first day of March, 1876, an assessment (No. 1) of 25 cents per share was levied upon the assessable portion of the capital stock of the corporation, payable immediately, in United States gold coin, to the Secretary, at the office of the company, No. 702 Market street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the fourth day of April, 1876, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 24th day of April, 1876, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.

WM. SMALL, Secretary.
Office, 702 Market street, Room No. 2, San Francisco, California.

Josephine Gravel Mining Company—
Principal place of business, San Francisco, Cal. Location of works, Brushy Canyon, Placer county, Cal.

Notice is hereby given, that at a meeting of the Board of Directors, held on the twenty-third day of February, 1876, an assessment (No. 1) of 10 cents per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold and silver coin, to the Secretary, at the office of the company, 331 California street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the twenty-fifth day of March, 1876, will be delinquent and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the tenth day of April, 1876, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

WM. SMALL, Secretary.
Office, No. 331 California street, San Francisco, Cal.

Klamath Quartz Mining Company—
Location of principal place of business, San Francisco, Cal. Location of works, Liberty township, Siskiyou county, Cal.

Notice is hereby given, that at a meeting of the

1876, an assessment of three dollars (\$3) per share was levied upon the capital stock of the corporation payable

Immediately in United States gold coin, to the Secretary, at the office of the company, room 8, No. 11

Mariposa Land and Mining Company of California. Location of principal place of business, San Francisco, Cal. Location of works, Mariposa county, Cal.

Notice is hereby given that at a meeting of the Board of Directors held on the twenty-third day of February, 1876, a assessment, (No. 4) of one dollar per share was levied on the capital stock of the corporation, payable immediately in United States gold or silver coin, at the office of the company, room 33, Nevada block, No. 09 Montgomery street, San Francisco, Cal, or to the Assistant Secretary, at the office, No. 9 Nassau street, New York City.

Any stock upon which this assessment shall remain unpaid on the twenty-fourth day of March, 1876, will be de-

inquent, and advertised for sale at public auction, and unless payment is made before will be sold on Monday the

On the 14th day of April, 1876, to pay the delinquent assessment together with costs of advertising and expenses of sale.

By order of the Board of Directors.

W. H. SANDER LEAVITT, Secretary.

Office, room 33, Nevada block, No. 309 Montgomery street on Francisco, Cal.

New England Tunnel and Smelting Company—Location of principal place of business, San Francisco, Cal. Location of works, Talara County, Peru.

Resolved, That a meeting of the Board of Directors, held on the fifteenth day of February, 1876, an assessment of ten cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold and silver coin to the Secretary, at the office of the company.

Any stock upon which this assessment shall remain unpaid on Saturday, the twenty-fifth day of March, 1876, shall be sold, and the proceeds of the sale shall be applied to such assessment; and unless payment is made before, will be sold on Tuesday, the fourth day of April, 1876, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

OLINTON O. TRIPP, Secretary.

Office, room 10, No. 401 California street, San Francisco

Qal.

The California Watch Company—Loca-

tion of principal place of business, San Francisco, Cal.
Location of works, Berkeley, Alameda county, Cal.
Notice is hereby given that at a meeting of the Board of Directors, held on the eighth day of March, 1876, an assessment (No. 1) of five dollars per share was levied upon the capital stock of the corporation, payable immediately to the United States gold coin, to the Secretary at the office of the company, room 10, No. 120 Street street, San Francisco, Cal.
Any stock upon which this assessment shall remain unpaid on the eighth day of April, 1876, will be delinquent and advertised for sale at public auction, said unless payment is made before, will be sold on Monday, the first day of May, 1876, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors.
H. T. GRAVES, Secretary.
Office, room 10, No. 120 Street street, San Francisco, Cal.

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 Reports Made, Mining Companies Organized,
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WADE'S OPERA HOUSE, Mission Street, near

Third. Open every evening with Mrs. Anna's Dramatic Company. Box office open from 3 p. m. to 10 p. m. Doors open at half past seven. Commence at eight o'clock. Monday evening, March 33, 1876, JOSEPH MURPHY in "HELP."

CALIFORNIA THEATER, Bush Street, above Kearney. Open every evening with the best Dramatic Company in the United States. Box office open from 3 p. m. to 10 p. m. Doors open at half past seven. Commence at eight o'clock. Monday, March 27, 1876, JOHN MC OULLOUGH.

ANGEL'S CHARCOAL DENTAL SOAP for Whitening and Preserving the Teeth. J. W. ANGELL, Prop., San Francisco.

Tuscarora District.

The following letter, describing a new mining district in Nevada called Tuscarora, appeared in a recent number of the Gold Hill News. This town is situated about 50 miles north of Elko, at the foot of the Tuscarora mountains, which form the western boundary of Independence valley, through which the South fork of the Owyhee river takes its course into the Soake, and thence into the Columbia. The district is about 10 years old, but has been prospected very little, having been worked for its placers ever since its discovery, by Chinamen, with very good success, gold being found in all gulches on the range, and in many places a prospect as high as 50 cents to the pan has been obtained, although the ground as a general thing will not pay white men. There are at present about 60 white men in the camp and about the same number of Chinamen. The town consists of about 20 houses, two hotels, two stores, one lodging house, one blacksmith shop, one barber shop, one butcher shop and three or four saloons. Msals can be had for 50 cents and good beds for one dollar per night, although the accommodations are limited, and if there is a rush here in the spring some parties will have to camp out and rough it. It is a very poor place for men to come to in search of employment, there being too many here at present for what work there is to be done; but if a man wants to prospect this is as good a place as any in the State. There are two stage-leaving Elko for Cornucopia and this town three times a week. The fare is \$10 to either place. The ledges here are small, being from 18 inches to six feet in width, and run in a northerly and southerly direction. The country formation is granite, and the ore is easily milled. So far as I can learn, no base ore has been found in the district. Timber is scarce in the neighborhood, wood being worth \$15 per cord, and in consequence every one burns sagebrush.

The principal mine here, that in which the most work has been done, is the Young America. There are at present employed in the mine six men. The company have taken out about 400 tons of ore this winter, which will average about \$100 per ton. They intend erecting a 10 stamp mill as soon as the roads will admit of their hauling the necessary lumber and machinery.

The Oroide mine was found last July, by Col. W. R. DeFreese. He is working six men, and is taking out about three tons of good ore per day. The Colonel has purchased a small mill, formerly owned by the Young America company, and is hauling his ore to it for reduction.

The Grand Deposit mine was found last August by Thomas B. Hanoum. The ledge is about three feet wide, the ore strongly resembling the Comstock. It assays from \$60 to \$800 per ton; it is at present bonded by J. D. Andrews.

The Adeline mine shows some of the richest ore in the district. The ledge is about three feet in width, fine gold being visible in the ore. The South extension of the Young America is down about 80 feet, and has a good ledge. The Northern B ledge has a shaft down about 60 feet, with very good ore indications.

There are many other locations equally as good as the above mines, which I have not yet visited. They will all be worked as soon as the snow melts so that men can work to advantage.

As no prospecting was done to amount to anything before last summer, many think that the best locations are yet to be made. Taking everything into consideration, there is at least a strong promise that this will be a good camp this coming summer, and when the erection of the necessary mills and machinery for crushing the ore is completed it will prove the equal, if not the superior, of its neighbor, Cornucopia; and as its mines are opused and new ones found it will give employment to hundreds of men, and prove conclusively that Eastern Nevada, as a bullion-producing region, is far from yet being exhausted. Not much prospecting can be done in the mountains before April.

From parties who have recently visited the placer mines at Fort Lane the Jacksonville Sentinel learns that the previous reports of their richness are not exaggerated. A nugget weighing \$400 was picked up by Mr. James McDonough, and several other smaller pieces have also been found. The depth of bedrock is not more than two feet, and after sluicing off the dirt gold in considerable quantities is picked up from the bare rock.

The Virginia Enterprise says that there are now more workmen in that city than can find employment. It says: Let no more workmen in any place be persuaded into coming here. But a certain number of men can be worked in the mines along the Comstock lode and in the towns thereof, and many more are now here than are required.

The Truckee Republican of the 1st says: "A new contract has been entered into by the railroad company for 40,000 cords of wood, to be delivered at the track, between the Summit and Verdi. This will put \$60,000 in circulation here, and furnish employment to a great many men and teams."

ALL of the country for four or five miles west of Steamboat springs has been located for cinabar. The Hot springs ground has been taken up, and notices have been posted all over it.

Giant Powder.

Patented May 26, 1868.

THE ONLY SAFE BLASTING POWDER IN USE.

GIANT POWDER, NO. 1,

For hard and wet Rock, Iron, Copper, etc., and Submarine Blasting.

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For medium and seamy Rock, Lime, Marble, Sulphur, Coal, Pipe Clay and Gravel Bank Blasting, Wood, etc.

Its EXCLUSIVE use saves from 30 to 60 per cent. in expenses, besides doing the work in half the time required for black powder.

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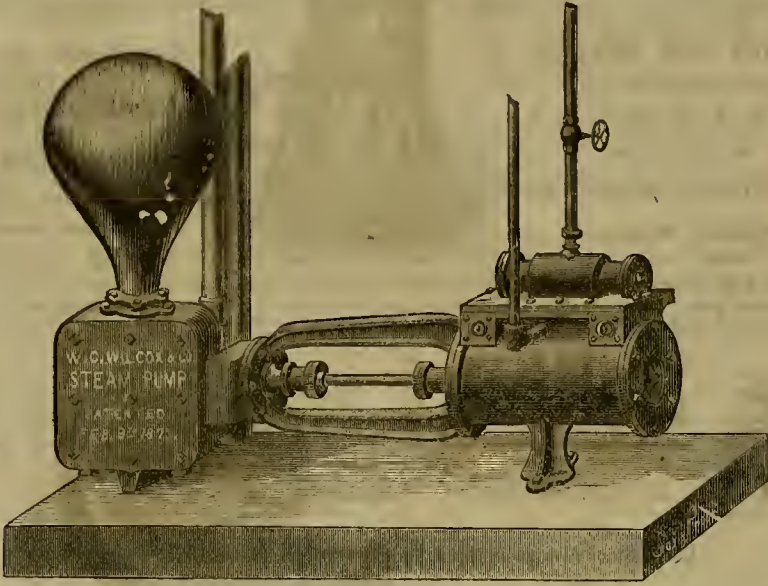
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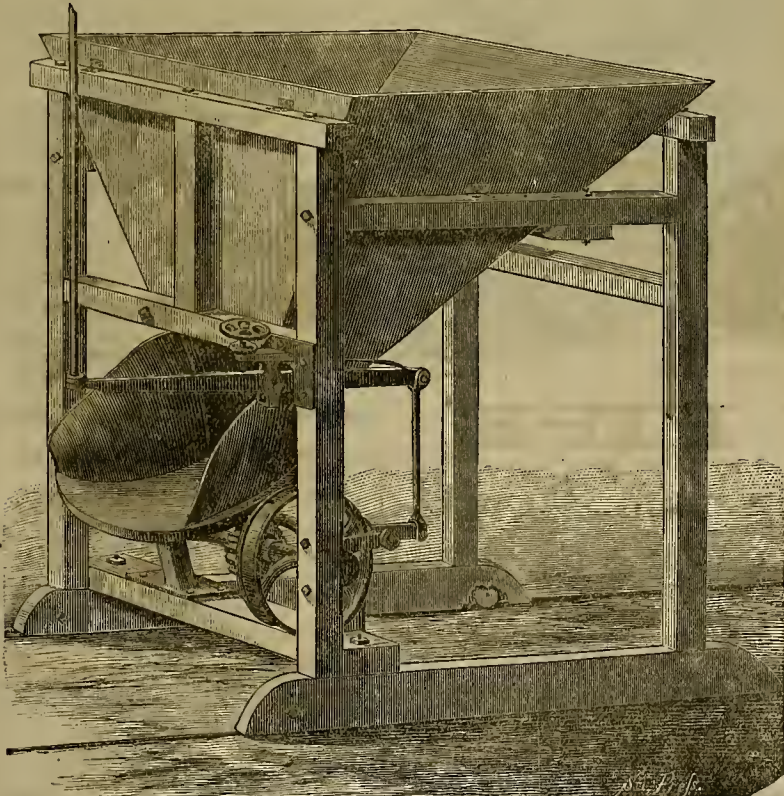
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late Mechanics' fair, received the premium over all competing feeders. One was recently set up at Schnabel's
mill in Newcastle, Placer county, Cal. It very soon showed itself to be the thing wanted; all other feeders
under examination were at once rejected, and three more ordered for the same mill. We refer to the following
mills using the Cochrane feeders: St. Patrick, Pugh, Green, and Julian, Newcastle, Placer county. Keystone
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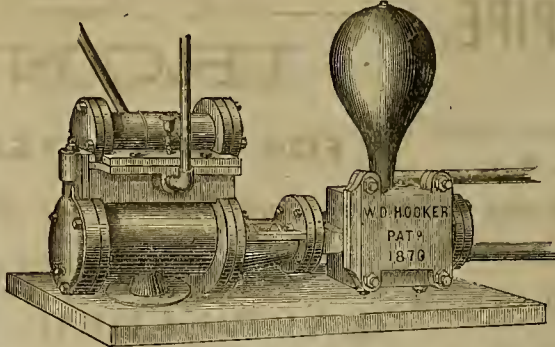
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fully. It is grinding on an average 2,500 lbs. good meal per
hour, and has ground 2,800 lbs. in an hour. It is driven by an
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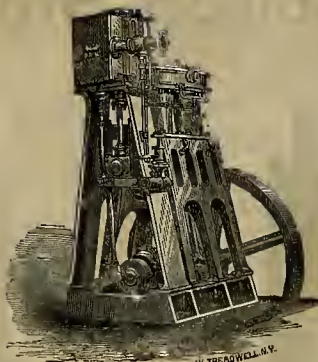
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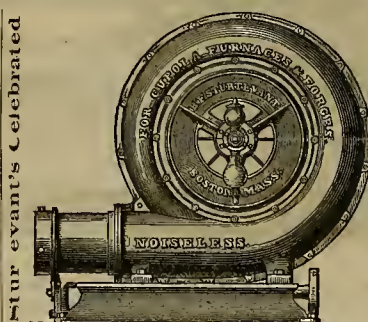
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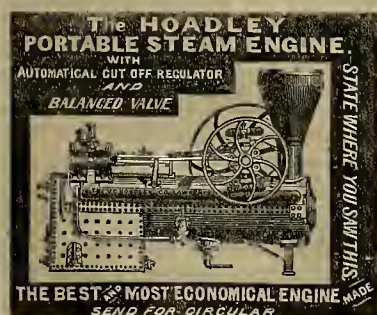
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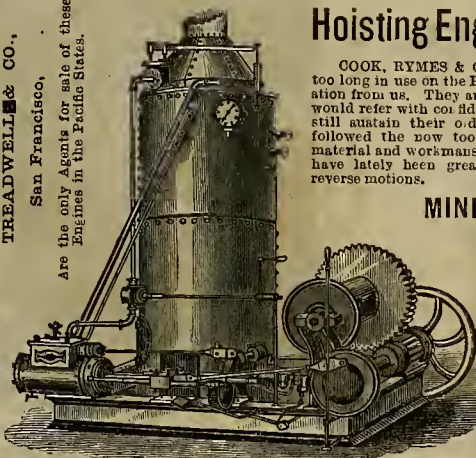
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SAN FRANCISCO, SATURDAY, MARCH 25, 1876.

VOLUME XXII
Number 13.

The Glacial Epoch.

The impression which generally obtains in regard to the glacial epoch is that it consisted of an enormously long and unbroken period of cold, during which the northern hemisphere of the earth was covered with an immense ice cap of many miles in thickness within the Arctic circle, and gradually thinning out to nothing as it approached the tropic. This indeed was, at first, regarded as a fact by all scientists. But, as observations multiplied the interpretations of the deposits failed, in many instances, to sustain such a theory.

Deposits containing organic remains of tropical and temperate fauna and flora were found placed between immense deposits of unmistakable glacial origin. Remains of the elephant, the rhinoceros, the hyena, and of the tropical plants which always accompany those animals, were found in heavy strata, which rested directly upon other deposits which must at some time have been covered for a long period with an ice sheet; and these animal remains were again found covered with other glacial deposits of a later period. Such reports were at first ignored as too uncertain to be received as facts, or other and local causes were assigned for such peculiar superposition; but the accumulation of evidence finally led to a division of the glacial epoch into three parts—the second being a long period of interglacial warmth, during which Greenland and the northern portions of America and Europe were subjected to a semi-tropical climate.

But as observations have been extended, geologists have been compelled to further modify their theories and admit of still further divisions of the glacial epoch. The evidence now points to quite a number of changes between the extremes of heat and cold. These evidences have been found in numerous instances of well marked river terraces in Switzerland, Scotland and other portions of Europe, and also in the Lake Champlain and St. Lawrence river valleys in this country. In addition to the surface indications numerous borings have also been made at a distance inland from the terrace fronts, which fully sustain the multiple theory.

The first to detect the significance of these peculiar intercalations was the eminent Swiss geologist, M. Marlot, who some 20 years ago announced the existence of a warm interval intercalated between two glacial periods. The times of the continuance of these periods have also been made a subject of study by Professors Heer and Leibig, the first of whom placed the time required to deposit a certain peat bog at 6,000 years, while Leibig assigned 10,000 years for the same purpose. As this peat bog was about 60 feet thick and contained large quantities of the remains of elephants, stags, cave bears and other temperate or semi-tropical animals, besides insects, it is quite certain that the ice age must have been broken for a long time to admit of such an intercalated deposit.

These evidences add still further to the vast accumulation of proof that the earth must have been inhabited by the higher order of animals for an almost indefinite length of time. The fact is also now placed quite beyond the region of doubt that man existed on the earth anterior to the time of the last glacial period, the continuance of which cannot be set at less than 10,000 years, while a much greater duration must be allowed to the present era of warmth, during which man has been a constant occupant of the temperate zone.

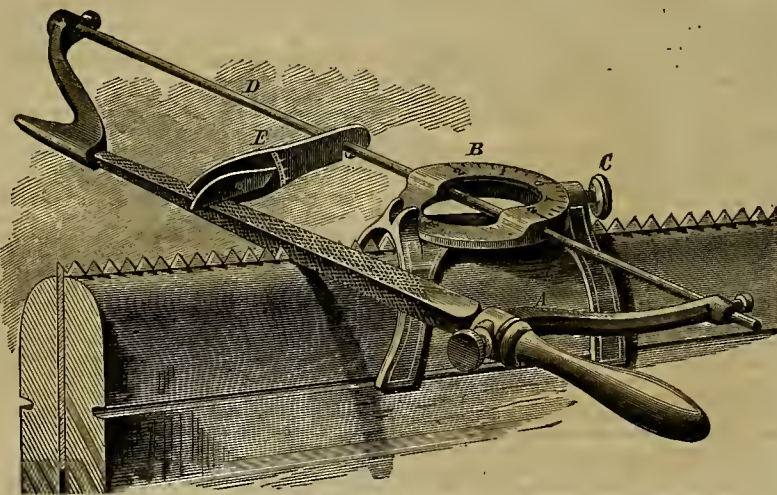
It has been assumed, and with a great degree of probability, that these irregularities of seasons may be attributed to the gradual change of the inclination of the earth's axis—that the earth is constantly vibrating in its inclination, from and to a perpendicular to the plane of the ecliptic—that on an approach to the perpendicular the tropics are extended north, while with its retrocession therefrom the frigid zone is brought down to near the tropics and we have a glacial period, which continues until by another approach to a perpendicular the ice is melted preparatory to another period of warmth. If this assumption is correct, a record must be inevitably made upon the earth's crust, and it is now

the province of the geologist to determine how many times the earth has thus swung back and forth since its crust became sufficiently solidified to keep the record, and to calculate, approximately, the periods of time thus occupied.

It is now well known that the ancient Egyptians and Chaldeans made astronomy a matter of very close study, and that they mapped the heavens so far as visible to the naked eye. It has also been pretty well ascertained that the pyramids had more or less connection with the astronomical studies of the Egyptians. The great pyramid stands with its four sides exactly facing the four points of the compass. It has also been observed that a line of its masonry points very nearly in a line to the North star, near, but not exactly to which the North pole of the earth also points. May it not be that the changes of the seasons of the earth to which we have alluded, were also known to that ancient and mysterious people, and that they also were curious to learn the cause? They knew nothing of a "North pole;" their theory was that the earth and the North star were fixed and immovable; that the sun in its revolutions around the earth came further north in summer than in winter. May they not also have

Saw Filing.

The accompanying engraving represents a saw file guide recently patented, for guiding the file during the operation of filing saw teeth, and is done in such a manner that exactly the same bevel and pitch shall be imparted to each tooth, and the file is made to cut more smooth and even; and which also admits, on the saw being refilled, of forming the teeth with the same bevel and pitch as in the beginning, thus requiring much less filing, with less wear to either the file or the saw, and the operation of filing is greatly simplified. The saw is secured in a wooden clamp, as shown, and held in a vice. The clamp has grooves on each side which extend its entire length, these serving as guides for flanges on the legs at the lower part of the frame, A. The frame may be freely moved along the grooves, and is by them maintained in uniform position as regards the saw. The sliding frame holds a graduated circle, B, and is held by a set screw, C; the guide rod, D, passes through holes in the circle as shown.



ROTH'S SAW FILE GUIDE.

suspected that the inclination of the earth might have a slow movement to and from the average position of the sun? Admitting these suppositions, what more natural inference than that a gradual increase of that inclination would produce the great season of cold, the existence of which might have been handed down from primeval races which had been driven from their warm and pleasant northern homes thousands of years before, to seek more southern latitudes as the earth gradually inclined itself away from the sun? Perhaps these same Egyptians might have been the descendants of those people. Admitting these further suppositions, would not such an intelligent and enquiring people have endeavored to devise some plan to detect and keep a record of the progress of such an important change? What more feasible way of doing so than to have fixed a permanent line, pointing to the only fixed star in the heavens, so that its possible deviations might be watched from generation to generation? That line, which has now maintained its position for 4,000 years, varies in pointing out the North star just about as much as the North pole varies therefrom! Have we here data from which to calculate the quantity of the enormous periods, whose effects are now so surely read by the geological student? Have we thus connected the observations of the ancient Egyptian astronomers with those of our own day? Another period of 4,000 years will be required to prove or disprove this assumption; but we need not erect a costly pyramid or even keep watch over that already erected to hand down our observations to the astronomers of A. D. 5876. The printing press will surely preserve our records, and the improved instruments of to-day will serve our astronomers far more accurately than did the skillful architects of 4,000 years ago.

It will seem that the latter can be adjusted so that any mark on its periphery coincides with a fixed mark on the frame, and thus the file, which is connected with the guide rod, may be set so as to impart any desired bevel to the teeth, this being denoted by the graduations on the circle. The file is supported in the arms attached to the guide rod, its end being inserted in a hole in one, and a screw clamp holding it to the other; by loosening the screw, the file may be turned so as to give any desired pitch to the saw teeth. At E is an indicator which shows the pitch at which the file is set, and thus allows of easy resetting to the same inclination at any future time, as when using a new file or another corner of the same file. The guide has in connection with it a table, in which are shown and arranged bevels and pitches for each kind of saw, and for sawing the various kinds of wood. This arrangement makes the guide so easily set for either kind of saw, that those not experienced in the art of saw filing find no difficulty to obtain proper bevels or pitches. The guides are made in a very neat and substantial manner, will last a lifetime, and are sold at so low a price as to place them in the hands of every one using a saw. By the use of this guide each person who uses a saw will be enabled to file his own saw in such a manner that it will do its own work in the very best manner, cut smooth, fast, straight and easy. These implements are manufactured by E. Roth & Brother, New Oxford, Adams county, Penn., and they inform us that a single one will be sent to any part of the United States for \$2.50. The guide is applicable to circular as well as straight saws.

The employees of the Richmond mine, at Eureka, have refused to accept trade dollars in payment of wages.

California and the Centennial.

With all the enthusiasm which has been manifested towards the Centennial exhibition in honor of the nation's birthday, we must confess that very little of it has appeared in California. Although individuals in different parts of the State have proposed to contribute articles of interest, no general movement has been made, nor has any appropriation been made by the State itself. The only large general collection of articles showing California products and curiosities which has been arranged, is that forwarded by the Central Pacific railroad company in care of an agent of their own.

There is no building for Californians to meet in, nor is there any official duty authorized to receive articles sent from this State. The Society of California Pioneers have appointed a committee to take the matter in charge and solicit funds to erect a Pacific coast Centennial hall at Philadelphia.

Although these gentlemen have found some difficulty in their work, they are now confident of success. The State of Nevada has appropriated \$1,000 towards the object, and Oregon and Washington will assist. The San Francisco delegation of the Legislature have been importuned to push the matter of the appropriation through as rapidly as possible. A bill is already before the House appropriating \$25,000 for Centennial purposes, but its passage has been very much delayed. If the bill is not passed very soon it will be too late for California as a State to make any proper showing. About \$5,000 of this will probably go towards the Centennial Hall.

The purpose primarily in view in erecting the Pacific Coast Centennial hall, is to provide a place of resort and shelter for the people of the Pacific coast visiting the exhibition, and at the same time to make the building, as far as practicable, a Western coast feature, by displaying in its interior finish a variety of characteristic woods and the addition of other objects of interest as means at hand will permit. Although inaugurated under the auspices of the Pioneer society, it is not intended to limit the interest and sphere of the scheme to its members alone. The opportunity to participate in the enterprise is thrown open to the Pacific States and Territories, and the special assistance of societies, corporations, orders and individuals is particularly requested and desired, as the object in view is common to all the citizens of the Pacific border. The committee having the matter in charge consists of Wm. S. O'Brien, (President), Josiah Belden, John B. Frisbie, Peter D. An, A. C. Bradford, F. MacCrellish, Louis Sloss and Albert Williams, (Secretary). The necessary funds are to be secured, aside from any appropriations which may be made, by the sale of tickets at \$5, each admitting the holder and his friends to the free privileges of the hall. These tickets will be given to subscribers according to the amount subscribed. Those desiring to aid this worthy object can address the Secretary of the committee, Albert Williams, 507 Montgomery street, in this city. We hope a liberal sum will be forthcoming.

It is a matter of regret to all old Californians that our young but wealthy State should stand a chance of being poorly represented when it has so much to show. The people should respond heartily in accordance with their means, to aid in the display of the products of the State. We urge all who are able to do anything to further the object to do it quickly, so that California will be properly represented at the great gathering of the peoples of the earth.

The branch "put" and "call" enterprise of McKee & Co., at Virginia City, has not been as successful as was anticipated by its projectors. The agent acknowledges that the Comstock miners know too much to be profitable customers. The receipts of the Virginia office foot up \$13,000, while the disbursements amount to \$60,000.

According to the books of the Union Pacific a daily average of 50 emigrants for the Black Hills go over that road.

The Virginia and Truckee railroad is now running 24 trains daily between Virginia and Carson.

Heat and Mechanical Force.

EDITORS PRESS:—Will some of your readers who are familiar with the subject and possessed of practical knowledge oblige others of your subscribers by giving us some information on the following points:

It is stated as Soule's equivalent, that a unit of heat (the amount of heat which will raise the temperature of one pound of water one degree) is equal to the mechanical force that will raise one pound 772 feet high. Now, how do they ascertain this result?

A pound of carbon is said to give out in burning 14,500 units of heat (we are dealing in round numbers), and as about 1,000 units of heat is required to evaporate one pound of water, and therefore one pound of carbon would evaporate say 14½ pounds of water, now, how much power would the above amount of water, converted into steam at a pressure of three atmospheres, give when applied to an ordinary non-condensing steam engine, making, we will suppose, no loss in friction or condensation? Also, now under this statement, how high would a unit of heat lift a pound weight? Please answer and oblige. OBSERVER.

The Contract System of Mining.

A correspondent of the *Eureka Sentinel*, writing from Ruby hill, among other things says: From reports in circulation on Ruby hill I infer that the Richmond mining company has already let, or are making arrangements to let, the whole Richmond mine on contract. A great deal of the ore now taken from the mine is extracted on contract by the ton, and the company's manager, having found it a convenient way, has concluded to let the entire mine.

There is no doubt that the contract system, if honestly carried out, is an economical way to work mines. When honestly carried out it is open to competition. Tenders are called for in the public press, and the proposal of the lowest responsible bidder is accepted. When this plan is adhered to there is no room for middlemen. The company gets its work done at the lowest rates. The profits from the labor of each individual miner are small, but taken together, where there is a large number of men employed, they aggregate a good sum at the end of the month.

On the other hand, the contract plan when not carried out on the square is the worst system that can be introduced—the worst for the company adopting it as well as for the miners. It is to-day the cause of many mines in Nevada lying idle, which, if they had been legitimately worked, would be productive. This is especially the case with mines owned by English companies. English capitalists reside at a distance from the scene of operations. Their representatives seldom come on the ground to examine the mines or the means that have been adopted to make them remunerative, and when they do come, sufficient opportunity is not afforded them to make themselves thoroughly acquainted with all the practices of their agents. Their agents are generally appointed in England. They expatriate themselves from their own country in the hope of realizing an independence in a few years. When they come here they set to work with a good will to accomplish the desired object. Many of them bring with them a clique of consorts or followers. All the lucrative offices are bestowed on these followers, and new offices created for their special benefit. They get contracts at far higher figures than would be given to mere strangers. Those who are not in the "ring" find it advantageous to connive at it and hold their tongues. In the presence of the miners, they are "in with the superintendent," and it is the safest way not to interfere with them.

Like our State politicians, these men are very fond of talking about retrenchment and economy. With them, economy means reduction of the wages. If the mine has failed to pay dividends, it is owing to the high price of labor. A show of economy is made by an attempt to lower the wages or increase the hours of labor. A cent is put into the company's pocket with the right hand, while a dollar is taken out with the left.

From the Black Hills.

The *Virginia Chronicle* publishes a letter from a former resident of Virginia, as follows:

CUSTAR CITY, FEB. 26, 1876.—I got in here on the 24th, and am much disappointed in the country. Men are working for three and four dollars per day at building cabins. I went down French creek and prospected but could not get more than two cents to the pan. The gulch is so flat that you cannot tell which way the water runs. I went out with a party of 22. Fourteen of our party have started for Hill city. Hill city is 16 miles from here. Most of the others will start for the back trip to-morrow morning. I will remain in Custar city, but I think it a great humbug. They have got a mill running and another one is on the road, which will be here in a few days. I will stay here, for I have got a good outfit and will take the chances. All the town lots are taken up and they are asking big prices for them. There is no money here. I have not seen a bit of dust. Don't think of coming here.

THE Douglas mill, Lower Gold Hill, has been obliged to shut down for want of wood.

Japanese Gold.

The Native Gold Fields and Methods of Mining and Reduction.

The accounts of the richness of Japan in gold ore have been copied from book to book, without having been sufficiently weighed and tested. When the Portuguese first came in contact with the Japanese—and even still many years later—there was a considerable stock of precious metals, and especially gold, in this country. This relatively large amount of gold does not prove, however, the extreme richness of the country, because it was in reality the product of gold washing during many centuries. Japan being closed at that time to nearly the whole world, the gold remained in the country and augmented with every year. Under such circumstances the quantity of gold must have been considerable after many centuries, even if the country contained but a very moderate quantity of ore. The extreme cheapness of labor in former times allowed of gold washing out of very poor gravel, which could not, without a decided loss, be worked either in Europe or America. The production of gold being moreover larger in relation to silver than in other countries, the relative value of the first precious metal became quite different from our standard. Whilst in Europe the relation between gold and silver varies only a little between 15 to 16.1, there has been a time when this relation was in Japan 6:1. The Portuguese and afterwards the Dutch have had the advantage of leveling the ground considerably, whilst the opening of Japan in latter years has done the rest. The quantity of gold metal exported by the Portuguese during their stay in Japan, 1550–1639, may be estimated at least \$59,500,000 sterling, or an average of 660,000 yearly. Ksempfer speaks even of some years with an export of 2,500,000 of gold, and adds in his peculiar style, (Book iv., chap. v.), "If this trade had lasted but twenty years in the same degree, the Portuguese would have exported (out of this Ophir to Macao) the same quantity of gold and silver which the Bible says there was in Jerusalem during Solomon's time."

The Dutch afterwards exported chiefly copper and silver from Japan, but also gold, especially from 1649–1671. The quantity of silver exported by the Dutch alone during the seventeenth century may be valued at 112,000,000 of taels, and the quantity of gold exported the same period at 6,192,900 pieces of the old *koban*. During the eighteenth and nineteenth centuries there were besides exported considerable quantities of gold and copper. The whole quantity of Japanese gold and silver exported during the sixteenth and seventeenth centuries may be estimated as follows: Portuguese, gold and silver, \$59,500,000; Dutch, gold, \$15,482,250, silver, \$28,000,000,—\$43,482,200; total, nearly \$103,000,000.

We have had the opportunity of seeing many gold ores out of different parts of Japan. The last exhibition in Kyoto (1875) had about 20 samples accurately labeled, with the localities of occurrence of nearly all these provinces, in which gold is more or less worked. By the kindness of the local government we obtained and examined these specimens, together with the samples in former collection. Most samples consisted of ochry silicious conglomerates and ochry argillaceous gravel, there being very few samples of more dense and pure auriferous quartz or feldspar. Nearly all rocks had a disintegrated character, caused by the long-continued action of air and water. The samples of alluvial auriferous gravel proved undoubtedly their origin as products of disintegration from primitive rocks, under the continued action of torrents. The gold in these alluvial deposits was found in very small scales, so that the aid of a lens was necessary to discover them, and in many instances the gold dust could only be ascertained after a process of washing and levigation. Gold in dendritic forms we have only seen in some samples of pure auriferous quartz from Satsuma and Kai. The general aspect of all these ores was poor. Considering further that samples in an exhibition usually represent the better kinds, we cannot but believe that Japanese auriferous gravel or quartz is, as a rule, poor, although these gold-bearing minerals occur, often in considerable quantity, in many different localities.

The Japanese manner of extracting the gold from the auriferous minerals is very simple and agrees in the main points with our old Western method. If the gold, as is mostly the case, is to be extracted from sand or alluvial deposits of rivers and torrents, then the separation of the small gold scales is effected by washing the gold sand either on an inclined plane or levigation apparatus, or directly on mats in a washing dish. The gold dust obtained by the washing process is melted on the bottom of calcinated salt, until a button or half round nugget is obtained. In the gold mines where the auriferous mineral consists of hard quartz rock, feldspar or feldstone, the ore must be crushed by means of large iron hammers. It is then roughly powdered in a mortar, in which the pestle is worked by the foot, and finally ground in a stone mill. Being thus minutely divided, the powder is washed in the same way as above.

When the ores consist of auriferous metallic sulphides, (copper or iron pyrites, grey copper ore, etc.,) they are first crushed and roasted. The roasted mass is powdered and melted until a coarse metal is obtained. The earth now contains the whole of the gold. The crude metal is then fused with some lead, which extracts the gold and falls to the bottom. The

alloy of lead and gold is then finally treated by a cupellation process.

The process of abstracting gold from the ore by means of amalgamation with quicksilver is unknown to the Japanese. The Japanese possess no good process for the separation of gold from silver. Hence, all Japanese gold contains more or less silver.

On the occasion of opening a gold mine, according to old Japanese custom, first a feast, the feast of the mountain gods, must be celebrated at the mountain or place where a gold mine is to be opened. The best and most propitious day for this feast is the 9th of the 7th month. A small temporary shrine is constructed, and wrestlings and other kinds of amusements are ordered from Kioto or Osaka to smuse the villagers and the miners, who will enjoy the opening of a new mine. The priest takes care to ask the favor of the gods for the new enterprise.

When the miners have brought their ore out of their mine, the women commence by crushing it roughly with hammers; subsequently it is powdered in the mortar and stone mill. The powder is now given into the *Nekata*, the water of a bamboo aqueduct running into this reservoir and flowing off, through the opening below, on the wooden plane. The gold-sand runs off with the water, but, being heavier than the small particles of sand and gravel, the gold dust remains in the greater part on the wooden plane, where it is collected and still further washed by the cotton sweeper. The water runs finally into a large hole, where the heavier gold dust which might have escaped from the plane, sinks to the bottom and can be collected afterwards. The gold-sand being thus concentrated, it is transferred to the shallow wooden washing board or the so called "pan." This is done with great care, in a large wooden tub filled with water. The board is first floated on the water, and the sand slightly shaken by a slight oscillating motion. From time to time the board is raised from the water, and the less heavy sand washed away from the gold by some quickly effected longitudinal jerks. Thus alternately and skillfully moving the board, the bright yellow gold grains become more and more visible and separated from the sand or quartz. Finally the gold dust is dried and further separated, by blowing, from some heavy iron sand, which is generally still present. The process of washing on the board requires great skill and dexterity.

The gold thus obtained is now fused and hammered in order to obtain a metal button or bar. A round cavity is made of ten parts of calcinated salt and buck-ashes and one part gold dust put on it. By means of a strong charcoal fire the gold becomes fused, and is then strongly hammered until the piece of metal has the desired shape.

The best gold field in Yesso, tried by Mr. Munroe, was that of Toshibetsu. The gold-sand here contains, however, but one-half of the amount of gold which the poorest gold fields of California contain.—*Japan Mail*.

THE PRODUCTION OF ARSENIC IN COPPER MINES.—In 1873, 5,449 tons of arsenic were produced in England. More than a third of it came from the Devon Great Consols mine. Sometimes 200 tons a month are sold from this mine, a quantity of white arsenic sufficient to destroy the lives of more than 500,000,000 of human beings. The Commissioners of Mines saw stored in warehouses of the mine, ready packed for sale, a quantity of white arsenic probably sufficient to destroy every living animal upon the face of the earth. The Commissioners consider that, in the case of mines in which arsenic is actually manufactured, it is only reasonable that the manufacture of a poison so virulent should be subjected to a special State supervision; and they submit that an officer should be empowered to require that the best practical means be taken not only to prevent the poisoning of the air by the volatilization of the arsenic, but also to hinder the access of the poison to the running water.

THE contract for bridging the Owyhee river has been forwarded, funds having been liberally subscribed for that purpose. The completion of this bridge will insure to Winnemucca a heavy freightage to Cornucopia, and in return will be made a shipping point for all bullion taken from that now fast increasing and popular mining camp. The road from this point exceeds in length by a few miles other roads now in use to Cornucopia, but the admirable grading of the Winnemucca route, and the total absence of snow drifts during winter, will render it the established and acknowledged route.

ANOTHER coal vein has been discovered near Seattle. It is nine feet thick, the outcroppings much resembling those of the Talbot mine, and it is situated near the intersection of the White and Stuck rivers. The vein has been followed for a mile or two. Several of the farmers near by rushed up to Olympia to enter the land, only to find out when they got there that the coal was on the old Mucklehoot reservation, and was not open for entry.

THE Suto tunnel is now in 12,600 feet, and work in the header is progressing at the rate of 100 feet a week, while the tunnel is being widened out at the rate of 400 feet per week. One hundred and ninety men are now employed, and 20 mules.

THE citizens of Independence, Dalles, Jefferson and Buena Vista propose to construct canals and mill races at these points, thus making fine water powers for mills and factories.

Prospecting for Sulphur at Steamboat Springs.

The recent remarkable discoveries of ores and minerals of various kinds made in the neighborhood of Steamboat springs, are causing a considerable amount of speculation in regard to what may underlie that region at no great depth. Some who have been ruminating on the matter are of the opinion that under a crust of 200 or 300 feet in thickness there exists a large lake of boiling water, while others believe that at about the same depth below the surface still is fire and red hot and molten rocks. Those who advance the first mentioned theory say that the minerals contained in the water of the boiling lake first formed a crust around the shores, and that this grew as ice grows upon a pond in winter, till the concretions covered the whole of the water, except spout holes here and there. Through these spout holes steam and water were forced up, and thus thickness was gradually added to the crust covering the subterranean lake. They think that this lake may extend under the greater part of the Truckee meadows, as some years ago, on the occasion of a severe earthquake, all the land both in Steamboat valley and Truckee meadows was rolled and tossed like the waves of the ocean.

Prospecting for Sulphur.

Those who believe that there is fire somewhere far down in the bowels of the earth say that beds of iron pyrites are necessary to produce (by their decomposition) the combustion, and all below must be solid, or at least there is no body of hot water of such an extent that it could be called a lake. They also say that there can be no lake, because in certain places there rush up strong blasts of hot, dry air or gases, which must come from a point where there is fire, or at least great heat, but no water; as no steam is mingled with the gases. In places a mile or two to the westward of the present active springs, where men are now engaged in prospecting for sulphur, it is found that at the depth of three or four feet the rock is quite hot and the sulphur in some of the beds is so hot when first opened upon that it cannot be held in the hand. This great heat at a point so far from the present active springs is what has given the miners the idea that a lake of boiling water underlies the whole region. An experiment that many would like to see tried would be the boring of a hole somewhere in the neighborhood of the present active springs. The rock is somewhat like lava and would be penetrated very rapidly with a diamond drill or even with ordinary steel boring apparatus.

Is There an Underground Chamber?

We are of the opinion that a depth of 200 feet would not be attained before an underground fissure or chamber would be tapped that would throw a stream of water to the height of from 100 to 200 feet, either constantly or at regular intervals. The present proprietor could in no way so cheaply add to the several attractions of the place as by starting a bore there, not for oil, but for—well, that which is supposed to be not far away from that place. It is a sure thing that a hole bored into the red hot bowels of Steamboat springs would develop something worth seeing, and we hope the proprietor will prospect the lower levels of his property during the coming summer. Deep in the earth there is pent up at that place an immense force. In the spring of 1860 there was a sort of well toward the north end of the range of springs that sent a column of water three feet in diameter to the height of at least 60 feet at intervals of about eight hours. This finally became clogged up, and in 1862 a stream of hot water about three inches in diameter was thrown to the height of about 100 feet at intervals of half an hour. The hole from which this stream was thrown soon became clogged up, and since then we have had no extraordinary spouting of water at the springs, but an artesian bore would doubtless start a new geyser.—*Virginia Chronicle*.

ON the summit of Pike's Peak, over 14,000 feet above the sea level, where there is not a trace of any vegetation, or, indeed, any earth upon which shrubs or grass could grow, the mountain rat, an animal twice as large as the Norway rat, abounds in vast numbers, overrunning the United States signal station on the apex of the mountain. Last summer two terriers, which distinguished themselves in the rapids of Chicago and Denver, were taken to the house and turned loose at night into the kitchen, but in the morning one was missing entirely, and only the skeleton of the other remained, both having been overpowered by superior numbers. Four huge cats have now been introduced, and it is expected that the number of rodents will soon be visibly diminished.

BESIDES their 120-foot plank, the Oregonians have made up their minds to exhibit at the Centennial a section of a fir tree 7 feet 6 inches in diameter 130 feet from the ground, and the section of another fir 5 feet through 200 feet from the ground. Oregon will not have any palm tree at the exhibition, but she is sure to carry the palm away so far as trees are concerned.

THE Oakland, Berkeley and Contra Costa railroad company promises to build the entire road from Walnut creek, Contra Costa county, within 18 months, expending \$1,000,000 in its construction. The company will also establish a ferry from the foot of Market street, with boats equal to those of the Central Pacific railroad company.

SCIENTIFIC PROGRESS.

New Industrial Applications of Salicylic Acid.

M. R. Wagner, in the *Technologist*, enumerates a large number of industrial uses to which the newly discovered salicylic acid can be applied in addition to its various medicinal uses. If during the past two years science had made no other discovery than this useful product, it would still have conferred a most important boon upon mankind. We enumerate, briefly, some of those numerous applications:

The Preservation of Food Products.

The antiseptic, tasteless and innocuous qualities of this acid render it of great value in this direction.

Fresh, uncooked meats, washed in an aqueous solution of salicylic acid and afterwards secured in hermetically sealed cans, and placed in a cellar, was kept, by Mr. Wagner, perfectly free from taint from April 28th, 1875, to June 25th.

When added to salt brines used for the preservation of food, it is found a great assistant and keeps the brine sweet.

It has been used with great benefit in the preparation of smoked meats.

One or two parts in one thousand kneaded into fresh butter will keep that article sweet in summer time from four to eight times as long as when nothing but salt is employed.

Its Use in Arts and Manufactures.

In the manufacture of wine it is thought (though not yet tried) that a very small quantity placed in each cask will so retard and modify the progress of fermentation as to be of great use in securing and preserving the delicate bouquet of that product. If so, its aid will also be valuable in the manufacture of vinegar.

In the manufacture of glue and gelatin, salicylic acid may be advantageously employed in the macerating vats, also in boiling it appears to facilitate the conversion of the tissues into gelatin.

The sizing used by weavers and the paste employed by bookbinders, paper-box makers, etc., is preserved from fermentation by this new and useful product.

The albumen of blood or eggs may be preserved by it for an indefinite length of time.

In tanning salicylic acid seems to promise a new and most important agent. Its presence in the "sour bath" prevents putrid exhalations and gives to the hide a decidedly improved appearance. It is also thought that it will facilitate the ordinary action of tanning materials in its action upon the gelatin and in preventing souring of the bark liquors, which produces gallic acid that works a hindrance to the tanning process.

Its employment is specially advantageous in the preparation of skins for gloves, and in the preparation of parchment, vellum, gold-beater's skins, strings for musical instruments, etc.

It has also been found of great advantage in the preparation of dyes, inks, perfumery, etc.

The full value of this most important product is still far from being fully known. Mr. Wagner and other scientific investigators are continuing their researches, and will no doubt continue for a long time to come to announce further applications of this acid in chemical arts and in manufactures.

Geographical Progress in 1875.

In his late annual address, in New York, before the American Geographical Society, Chief Justice Daly presented a comprehensive statement of the "Explorations, discoveries and geographical work of the world in 1875" of which the following is a brief summary:

The year has been distinguished by activity in every branch of scientific enquiry, but particularly in geographical exploration and discovery. No single year's work since the 15th century has exceeded it in interest.

In the United States the work of exploration has been confined largely to the coast survey, in which the work of Mr. Wm. H. Dall, on the northwestern coast, occupies a decided prominence. Lieut. Wheeler's explorations in Colorado and New Mexico have also been important and exceedingly interesting. The ruins of ancient villages in those regions show that that region was once as densely populated as the Eastern or Middle States now are—the number of buildings to the square mile being equal if not greater. Some of the ruins in New Mexico were fortified structures having as many as 500 rooms each! The ruins of towns were found regularly laid out in streets and squares. Many important mineral developments have resulted from the explorations in Colorado.

The important Arctic event of the year has been the dispatch of an expedition of the British government under the command of Capt. Nares. Several other expeditions have also been sent out in the same direction by the Swedish and Russian governments.

Much has also been done during the year in Asia. The explorations in Northern Asia have induced the Russian government to decide definitely upon the construction of a railroad through that region to the shores of the

Pacific. Important explorations have also been pushed in India, during which a male and female specimen of a dwarfish race have been captured, who are of a race of which no trace had ever before been found.

The man was four feet six inches high and 26 1/4 inches about the chest. He had a round head, with coarse, black, woolly hair and dark brown skin. The lower part of his face projected like a monkey, with thick lips protruding an inch beyond his nose. He had a comparatively long body, with short, bony legs. He had a grayish, bristly mustache, but no beard. The woman was well developed and about the same size. She had a yellow tint, with long, straight, black hair and a pleasant expression. They were dressed in loose cloths, and though they ate flesh, they lived principally upon honey and nuts.

The chief geographical events of the year in Africa were the exploration of the Victoria Nyanza by Stanley, and the journey across that continent by Lieut. Cameron, from Lake Tanganyika to Benquella, on the western coast, about latitude 11° 56' south. An Egyptian geographical society has been organized by the liberality of the Khedive for the purpose of exploring Northern Africa. It has already 300 members, and an annual income of \$7,000.

The New Metal, Gallium, and its Salts.

M. Lecoq, in a communication to the French Academy, states that he has succeeded in obtaining the metal gallium and its salts in a tolerably pure condition.

When deposited by electric action, gallium forms a very adherent layer; it is hard; it is polished with difficulty by friction with an agate braisher. The metal thus acquires great brightness, and appears whiter than platinum. When the electric current and the relative dimensions of the electrodes are properly regulated, the gallium presents a beautiful dull surface of silvery white, finely granulated, and interspersed with small brilliant points, which the microscope shows to be crystals.

Gallium, deposited on a platinum plate, is not much oxidized during washing in cold or boiling water, nor on being dried in free air raised to about 200°. It decomposes water acidulated with hydrochloric acid in the cold state, and more rapidly in hot state, with a brisk liberation of hydrogen.

Notwithstanding the undoubted rarity of this new metal, close researches seem to indicate that it exists in small quantities in nearly all blends. The extreme sensibility of its spectral action is liable to lead to an over-estimate of its quantity.

M. Lecoq, after enumerating the actions and proportions of the various salts of gallium, adds: "If there is no error as to the nature of the metal, the existence of this salt fixes the atomicity of the new element, and attributes to its oxide the same chemical functions as that of alumina. The oxide of gallium, then, will be written Ga₂O₃.

PENETRATION OF ROOTS IN ROCK.—In the Paris exposition of 1867, some specimens of white marble were exhibited in which were furrows channelled in the stone by the action of the carbonic acid exhaled by the growing roots of adjacent trees. M. S. Meunier reports a similar case at Orsay, in a still more resisting material, close-grained siliceous sandstone. Here the roots of some elm trees were found to have made their way into the rock by decomposing the very small portions of calcareous matter cementing together the siliceous particles. An entrance thus effected, they seem to have acted, in part chemically by dissolving the cement, in part mechanically by forcing the grains of sandstone apart. In this respect the fibrils to have been much more active than the larger roots. Eventually, they died off for lack of nourishment, and the greater part of their remains disappeared, leaving only tubular molds, varying in length from three-one-hundredths to three-tenths of an inch, with sides bearing the exact imprint of the roots. These were rendered more conspicuous by the yellowish stains due to the subsequent infiltration of surface water impregnated with iron. The case affords a good example of the manner in which roots occasionally penetrate into masonry, and is not without significance in a geological point of view, as showing that traces of recent vegetation may occur in rocks of older date. —*Comptes Rendus*.

SCIENTIFIC RESEARCHES IN THE CASPIAN SEA.—Oscar Grimm, the naturalist, has found a rich zoological field in the Caspian sea. He has examined the locality during but three months, dredging most in the bay of Balkan, at a depth not exceeding 150 fathoms, and has found 80 new species. Six of these are fish belonging to *Gobi* and *Bentho*, 20 are mollusca (mostly *Cardium* and *Dreissena*), 35 are crustaceans, including gigantic forms of *Gammarus* (water-fleas) and *Myis*, and 19 are annelids. He found but little life on the eastern side, owing to the outfall of sand from adjoining steppes; but on the west side life was very abundant, a single haul of the dredge bringing up over 600 individuals of several different families. The forms of animal life in the Caspian show a much closer affinity with those of the sea of Aral and Arctic ocean than with the Black sea.

AN INTERESTING EXPERIMENT.—A very pretty lecture experiment arranged to show the low temperature at which a flame may exist, may be pronounced in the following manner: Boil in a long necked flask, in which a tube has been

fitted with a tight cork, a small bit of phosphorus with five times its weight of lime. As the phosphorated hydrogen issues from the tube, it burns with a pale green flame, at so low a temperature that a common friction match may be held therein for a considerable time without taking fire. The experiment is somewhat dangerous, and should be made with great care, and with only a very small amount of phosphorus.

MECHANICAL PROGRESS.

A NEW SOURCE OF POWER.—M. G. Hanrian, of Meaux, France, has proposed a new source of power, obtainable in localities wherever an absorbent strata can be found underlying an upper strata, which holds the water near the surface. In such localities Mr. Hanrian sinks a well of large diameter down to the water bearing strata, and from the bottom of that sinks another smaller well down and into the absorbent strata. The lower well is curbed up from four to six feet or more, so that when the water in the upper well rises above the curb, it overflows into the lower well and from thence passes off into the absorbent strata. By this device there will always be a depth of water in the upper well equal to the height of the curbing of the lower one. The wells being thus arranged, a chain pump is placed in the lower well with the upper end of the chain passing over a pulley just above the top of the main or larger well, and so arranged that all the water that passes down must act upon the buckets connected with the chain. With this arrangement it is seen that when the water from the upper overflows into the lower well, the weight of the water will drive the pulley placed above the large well. Now, if another chain pump is properly placed in the upper well, and passed over a pulley on the same shaft on which the pulley already described is placed, it is evident that the column of water descending from the upper through the lower well into the absorbent strata can be made to raise another column of water of equal weight from the upper well to the surface. Thus a well so situated and arranged can be made to pump itself—and we have a new source of power which may be utilized as above indicated.

INVENTION RELATING TO CAR WHEELS.—A recent invention relating to the casting of chilled car wheels consists in constructing the metallic annular chill with annular air chambers at the points of the interior surface of the chill where the outer periphery of the flange of the wheel is formed, and also at the point where the outer horizontal surface of the tread is formed, by means of which the central portion of the tread, which receives the greatest wear, is allowed to harden; but the outer periphery of the flange and the outer surface of the tread are prevented from rapid cooling by the new conducting air chamber, and the metal at these points is molded and preserved in its full strength and tenacity, which is said to be a result to be greatly desired in view of the fact that, while the process of chilling hardens the iron, it greatly impairs its tenacity and strength.

AMERICAN STEEL.—An Englishman, now an ironmaster in Pennsylvania, says that steel is now being made about as cheap as iron; that every mill that is adapted to making steel has more orders than it can fill, and that such mills are running night and day on rails. Mr. S. B. Lowe says:—"In the Northern States the steel ores are almost exclusively confined to Lake Superior and Iron Mountain, both of which are many hundred miles from fuel. In Chattanooga, East Tennessee, we have a number of ore beds that are already being turned into metal and sold in advance to the manufacturers of steel. Still we must say that we as yet know but little of what we have. We have hundreds of ore banks that never had a pick nor shovel in them, let alone the fact that they have never been tested."

DYNAMITE OPERATIONS AT BLAST FURNACES.—For some time past one of Messrs. J. Brown & Co.'s blast furnaces at Sheffield has been losing iron, and it had at last to be stopped and blown out. The iron was then found to have got through the concrete bottom of the furnace, and that there was a mass of nearly 200 tons of iron in its place. Efforts were made to break this solid mass up by means of powder, but ineffectually, so that resort has now been had to dynamite. This powerful explosive has already dislodged about half the block, pieces of eight to 10 tons being blown off at each shot. —*Engineering*.

BEAM END PROTECTOR.—This is a new device, just patented by Mr. Norman McLellan, of Chicago. It consists of a tin hood, made to fit tightly over the ends of beams and joists, serving the two-fold purpose of preserving them from damp and protecting them from fire. It is well known that beams and joists, in party walls, often approach so near together that fire is readily communicated from one to the other, and it is safe to say that millions of dollars have been lost in consequence. The device is simple, but none the less valuable on that account, and it is to be recommended to builders.

The Danforth locomotive and machine company, at Paterson, N. J., is about to build 10 heavy locomotives for the Central Pacific railroad.

GAS FIXTURES.—This manufacture, though of quite a modern date, has nevertheless become one of the most important industries of the day, whether we regard it in the sense of the utilities it serves, or in the love of beauty to which it administers. A few years ago most of the gas fixtures used throughout the world were manufactured in England and France. Now, all such manufactures for this country are made at home, and large quantities sent to South America, Mexico, etc. The extent of this branch of manufacture in the United States may be inferred when we reflect that nearly all the dwellings, stores and shops in cities and large towns are supplied with gas fixtures, to say nothing of the numerous large residences and manufactories in isolated localities, the proprietors of which manufacture their own gas from some one of the numerous methods which have been invented with such an end in view. Progress in the knowledge of gas manufacture has been quite rapid, and is of late leading strongly in the direction of procuring gas from coal oil, which promises to work a great reduction in price and a more general use of gas instead of oil. The cheapening of gas and the simplifying of its manufacture will lead to a still greater demand for gas fixtures.

LOCOMOTIVES WITHOUT STEAM DOMES.—A correspondent of the *Scientific American* says: "The Boston and Albany railway company has some 240 locomotives, most of which have no steam domes; and if you ask the men who handle these engines how they carry their water, they will tell you that no engines work drier steam or less water than they do, under all circumstances. It is well known that much of the track of this line, on the mountain slope between Westfield and Washington, lays on a grade of 83 feet per mile. Steam domes are not only expensive, but are a decided injury to a boiler, and if locomotives work as well, they are certainly much better without them. This company is continually building locomotives without domes, which seems to be the best evidence possible that they are as useless as a steeple to a church." The journal from which we quote remarks upon the above: "There are many locomotives which have no steam domes. The celebrated Crampton engines, made in 1847, had none, and gave excellent results. It is usually considered, however, that drier steam is obtained from the top of the dome than from the shell of the boiler."

PARSON'S MANGANESE BRONZE.—A new variety of bronze, containing manganese, is just being introduced by Parson's white brass company. It is stated to be very valuable for all kinds of small work wherein gun metal is now used, and it is capable of being forged like iron. Specimens have been tested at the Royal Arsenal, Woolwich, with the most satisfactory results—yielding at from 14 to 16 tons pressure per square inch, and breaking at from 22 to 30 tons. Its ratio of elastic to ultimate was from 39 to 71 per cent., and its elongation from 8 to 35 per cent. In these trials six different specimens were employed—three of which were cast in iron molds and three forged from the same castings. The latter were of course much superior. The difference in the mode of preparing the test pieces for trial accounts for the wide range of results, especially in the matter of elongation. The sectional area of the test pieces was .533 square inches, and their length two inches.

A NOVEL PIECE OF DRILL WORK.—The American Diamond rock boring company, of Providence, R. I., lately finished the job of taking a 24-inch core out of the columns of the State capitol at Columbus, Ohio, the immense pillars in their solid state being considered too heavy for the foundations. This company are now shipping \$50,000 worth of their drills to the German government, and also filling orders from Sweden and Chile.

A VERY good impression of any article of metal having a flat ornamented surface may be taken by wetting some note paper with the tongue and smoking it over a gas flame. The article is then pressed upon the smoked paper, when, if the operation be carefully conducted, a clear impression will appear. This can be made permanent by drawing the paper through milk and afterwards drying it.

NEW TELEGRAPH INVENTION.—A new key is being put into the telegraph offices on the Pennsylvania railroad. This is a new invention, by which a dozen or more wires can be sounded with one key. Mr. Hussey, the inventor, is building a factory for the manufacture of the instruments.

NAPHTHA AS FUEL.—Experiments made with naphtha as fuel for steam engines in the south of Russia are stated to have yielded such satisfactory results as to induce the Russian government to order its use in future in all vessels stationed on the Caspian.

A PASSENGER locomotive is being built in the machine-shop of the Philadelphia & Reading railroad company, at Reading, Pa., for exhibition at the Centennial. It is to be entirely the work of apprentices.

COMPARATIVE COST OF STEAM POWER.—According to Ackermann's *Gewerbezeitung*, human labor costs, on an average, 90 times, electricity 70 times, and horse power 10 times as much as steam power.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

California.

AMADOR.

A HANDSOME FIND.—Amador Ledger, March 18: On Monday last Joseph Cuneo was engaged in wheeling a barrow full of retuse rock through Volcano, when he detected gold in a large piece of quartz which had been washed by rain. He immediately secured the prize, and found it to be auriferous throughout, large chunks of gold being visible all over it. The specimen is said to contain from \$50 to \$1,000 worth of gold—one of the highest finds that has been made in these parts for years.

DOING WELL.—We mentioned a few weeks ago that Richard Stocken had discovered a rich quartz vein a few miles above Volcano, and that he had washed the dirt in the vicinity of the lead, realizing a handsome sum therefrom. He is quietly pushing his operations, saying little to anybody, and giving no clue as to how he is panning out. He cleans up occasionally, and the impression is general that he has struck a splendid thing. The whole neighborhood thereabouts will undoubtedly be swarmed with prospectors the coming spring and summer.

THE MOHAWK MINE.—This mine is located some four miles beyond Volcano. Work is being pushed ahead as rapidly as the weather and facilities will permit. The vein is narrow, from 12 to 18 inches in width, but exceedingly rich in gold. There is a large quantity of rock on the dump awaiting shipment, but the roads are too heavy at present to admit of hauling it to the mill.

HYDRAULIC CLAIM.—The hydraulic claim of Messrs. Stickland & Hughes, seven miles east of Sutter Creek, is kept constantly at work, and the prospects are very encouraging. The first clean-up, made some weeks ago after a short run with very little water, realized only \$94. Now they have got the claim into thorough hydraulic order, and the outlook is flattering. A nugget worth \$20 was lately picked up in the sluices. The owners are energetic, enterprising men, and deserve success.

MAXIMILIAN MINE.—The Maximilian company have leased the old Rose mill on Sutter Creek for one year, and intend to put it in working order at once. The mill has been in long time, and has fallen into a dilapidated condition. The mortar block is badly out of wood, work rotted away, and flume and ditch in bad order. It will cost from \$2,000 to \$3,000 to put it in repair. The mill is only about half a mile from the mine.

BONANZA MINE.—We are informed that a rich body of ore has been struck in the south drift of the Bonanza mine at Drytown. The ledge is also widening out finely. Men are now engaged in retimbering the shaft. As soon as this is completed, sinking operations will be resumed.

CALAVERAS.

GRAVEL MINING.—Calaveras Chronicle, March 18: Gravel mining is progressing briskly again, now that the temporary lack of water, caused by land slides on the ditch, is no longer felt. All the hydraulics are in full blast and the tunnel claims running full handed. Lively times this spring.

GOING TO CLEAN UP.—A clean-up is to be made in the south hydraulic claim this week—the first of the season. The sliding of the hill has kept the fire pipes and machinery buried under the winter, to prevent being buried alive, that they haven't had time to lift a rifle since the rains set in. Now Mr. Veith intends unloading his sluice boxes.

SAN BRUNO.—It is expected that the "raise" in the San Bruno will be completed this week. The new hoist-lifts will be put up immediately, and the new machinery having been purchased and only awaiting better roads to be transported to the mine. With the opening of spring the upper country will be resonant with quartz mining music.

ALL RIGHT AGAIN.—The land slides that have lately impeded the flow of water in the ditch and somewhat interfered with mill operations, have been removed, and everything on the line of the canal is lively again. There is an abundance of the aqueous and good use is being made of it all.

INYO.

RUNNING.—Inyo Independent, March 10: The Union Consolidated company, at Cerro Gordo, are now running out bullion, though as yet they have been able to start but one furnace—the Baudry—on account of the snow rendering it impossible to obtain coal in sufficient quantity. It will be but a short time, however, before both furnaces will be in full blast.

DARWIN.—Cor. Bakersfield Courier, March 16: Most of the furnaces are idle at present, owing to lack of coal. The wooded district upon which Darwin is dependent for coal lies in the Coso range, eight or ten miles west of Darwin, and the snow is so deep that the coal production has been suspended for a time. The suspension will not be of long duration, and as soon as the snow melts the work will be resumed, and the Darwin furnaces will be running on regular runs of coal. Mr. Blanche has recently returned from a prospecting trip to the Lee district, some 15 miles northeast of Darwin. The character of the ore is totally different from that at Darwin, and is found in a range of low broken hills distinct from the Darwin range. Free milling silver ore is found here, but mostly in narrow ledges, and some of the assays are very high. As a general thing the ore lies in bunches, but the Cosos and Valentines show well defined leads. The ore is considered to be equal to the best White Pine. A five-stamp mill will be running by the first of May, and then there will come good reports from the Lee district.

MARIPOSA.

MARIPOSA LAND AND MINING COMPANY.—Mariposa Gazette, March 18: For quite a long time we have been without advice of the progress of the River tunnel and surrounding works, but it seems while we have been waiting they have progressed steadily. This main heading is now in 3,322 feet, with the face in very hard trap rock—no water to speak of. The boring by the Diamond drill from the heading of the west branch drift of this tunnel has proved successful. At a distance of 331 feet a body of quartz was struck through which the drill bored for 14 feet. The rock core taken out showed conclusively that it came from a vein, especially as a "rough" was met just previous to striking quartz. All credit is due to the engineer in charge of the Diamond drill, Mr. Frank Thoma, for the work taken in running his machine, the more as the space in which he operated was very limited. We are thoroughly satisfied that the Diamond drill, judiciously used, will be the means of revealing the hidden wealth of this estate. The body of ore just discovered is at a depth of 70 feet below the 1,400-ft station, so that the River tunnel must be driven 100 feet, and a cross-cut eastward of 70 feet before reaching the vein. Prospecting will be still carried on to further examine this deposit.

WASHINGTON MINE AND MILL.—This rich mine, which is located about two miles northwest from the town of Hornitos, in this county, and about which but little has been said, has been incidentally heard from. We learn, through a friend who resides in the vicinity of the Washington mine, that notwithstanding the severity of the weather, which has been so prevalent of late, has not occasioned any damages or delay in or about the premises, and that the 20-stamp quartz crushing mill and chlorination works are moving gently along, as though the elements of nature were undisturbed, as

compared with a mid-summer. This mine gives employment to about 75 men, who work underground, besides about a dozen upon the top, and about the mill. There are about 200 tons of ore already upon the dump which, as a matter of precaution, in case of a delay in the hoisting works of mine, is kept on hand, so that the mill can proceed until any cause of delay in the mine can be removed. The ore is rich in sulphurets, which are estimated at \$75 per ton, and the gold is saved therefrom by the process of chlorination, which adds largely to the average yield of the mine. The shaft is about 300 feet deep. There is no water below the 300-ft level, and the key consequence. The mill, mine, pumps and chlorination works are all of the first order, and in most excellent condition. The clean-up occurs every two weeks, and it is manifestly certain that this mine and its surroundings, which is under the direction of Mr. George E. Webber, superintendent, and Moses Rogers, an underground mining boss, afford to its owners a liberal dividend.

NEVADA.

OMAHA MINE.—Foothill Tidings, March 18: As we intimated the probability of, last week, the Omaha mine of this place declared its first dividend a few days since. The mine has been in the pockets of the stockholders of \$1 per share. The Omaha mine is owned by a board of directors, also, at the request and consent of holders of more than two-thirds of the capital stock of the company, decided to change the principal place of business from Sacramento to San Francisco, and change to be made on the 15th of April next. The annual meeting of the stockholders will take place at the Omaha office, 1015 Broadway, San Francisco, on the 15th day of April next.

SILVER.—Nevada Transcript, March 18: Most of the mines of this county yield only gold by mill process, but experiments by the Fryer process prove that many of them contain as much or more silver than gold. We saw some specimens of rock recently taken from the Independence mine, after it had gone through the roasting process of Fryer's works, in which chunks of silver of different sizes were thickly scattered all over the surface. The Star ledge, owned by Perrin & Brown, at Forest Springs, is another instance. It really contains more silver than gold, yet none of the silver has ever been saved by mill process. If Mr. Fryer had gone no further than this step, his invention, in our opinion, would have been as much value to the mining interest of the world as all the improvements heretofore made in quartz mining.

PLACER.

MINING ITEMS.—Dutch Flat Forum, Mar. 16: The storm mentioned in our last week's unabated fury till Monday afternoon, when it cleared and was pleasant during Tuesday and yesterday. The miners who have been waiting with anxiety for a few days of pleasant weather to complete outside work, eagerly took advantage of the circumstance and commenced work with unusual vigor. The men working on the splendid string of pipe being laid to lead the water into the Buckeye claim, and the men making the alteration in the Franklin pipe, changing it from the ditch of the South Yuba canal company to the Cedar Creek company, commenced work promptly and are pressing forward with all possible haste. The tunnel leading into the Dutch Flat claim is being driven with unusual speed, the contractors having made 207 feet last month. The work of constructing the sluices in the Yankee tunnel which was suspended owing to the impossibility of getting lumber has been resumed. The Yankee claim cleared up on Friday, the result being unusually good for the number of days run. The Pacific and Central claims have also cleaned up and are now re-ditching. The ditches are having a very rough time. The water has again been out of the ditch of the Yankee claim since our last, and the ditch of the Cedar Creek company covered with snow slides about a mile above Owl Camp, which shuts off the water so that that company now uses only about 800 inches running. The foreman of the latter ditch, John Foster, writes that he has been on that ditch for 10 years, but never has seen so much snow as at present. If the water does not hold out late in the summer we shall conclude that all signs fail.

SISKIYOU.

A MINING ENTERPRISE.—Yreka Union, March 18: Mr. Frank Abrams, who resides at the head of Coffee creek and Simon river, in what used to be Klamath county, has been prospecting in the vicinity of the latter river, and has discovered considerable ground in his vicinity for mining operations, and as soon as they can get in will commence work. One of the locators was up in the vicinity prospecting around sometime during last summer, and this company is formed on the result of his observations. The miners of Scott valley are jubilant. They have made a successful run, and are now commencing taking, which will no doubt insure them a golden harvest. Messrs. Kingery & Cory have found fine prospects in their quartz ledge, and are now well satisfied that it will pay for the construction of a mill. Messrs. Hopper & Son also intend to build a mill this coming summer on Rattlesnake creek, for crushing rock in that vicinity. We may therefore look for lively times in the mines.

SONOMA.

QUICKSILVER.—Russian River Flag, March 18: The Phoenix mine is working 12 men, prospecting, and finding some very fine ore on the lower level. Only a few more runs now, the furnace being temporarily closed down. In the last six months 511 dasks were produced, a good yield.

The Taylor mine, situated about 16 miles northeast of the upper end of Clear Lake, yielded one-half pound of pure quicksilver the other day from one common tank of ore, and that, too, not having been selected.

Nevada.

WASHOE DISTRICT.

BELCHER.—Gold Hill News, Mar. 16: Daily yield, 465 tons of ore, keeping the mills all running up to their full capacity. The ore breasts are all looking finely, and are yielding the usual amount of good ore. The prospecting department is working directly from the 1500-ft level is showing a steady improvement. The entire mine, in fact, is looking better with every step of development now making. The air shaft is being sunk at a rapid rate below the 1500-ft level. It is expected that the ground will be amply dry enough to start the pumps to working directly from the 1600-ft level, when once they are in running order.

JULIA.—Sinking the shaft is making excellent headway, the bottom still in quartz and ledge material of a highly favorable character. The face of the main southwest drift on the 1600-ft level has passed through the clay and porphyry encountered last week, and is now almost the grade of the low-grade ore. The prospecting department has just passed through to be nothing more than a large horse, and that the vein on that level is actually 400 to 600 feet in width.

CHOLLAS-POTOSI.—No ore is being extracted at present, owing to the bad condition of the roads. Sinking the combination shaft is making steady progress, the bottom during the first part of the week having run in very soft ground, with a strong increase in the flow of water.

NACARA.—The erection of the hoisting works is about completed, ready to resume the sinking of the main incline. At the time of the suspension of the work in the bottom of the incline last fall, some very favorable ore indications were encountered.

AMERICAN.—The erection of the new hoisting and pumping machinery is almost finished, ready for operation. It will not be long before the water is drained.

BULLION.—The main northeast drift on the 2000-ft level is steadily advancing, without a change in the porphyry formation. The north drift on the 1400-ft level has been cleared and repaired a distance of 216

feet. It is the intention in a very short time to start a winze downward from the drift to connect with the raise from the level below. This will give a good ventilation of the lower levels. It is the intention also soon as the north end of the drift on the 1400-ft level is reached and the repairs completed, to drive the drift directly ahead toward the north line. The company have yet 450 feet of virgin unprospected ground on the north end of their claim, of the character of which on the 1400-ft level nothing whatever is known. The ledge on the 800 and 1000-ft levels in that portion of the mine was over 150 feet in width, carrying rich streaks of gold ore, and it may be that a development in that portion may yet prove it to be the best portion of the mine.

CONSOLIDATED VIRGINIA.—Daily yield, 750 tons of ore, keeping all the mills steadily running. The ore breasts were never showing more favorably than at this time, and the future prospects of the mine never more flattering. The yield of bullion up to the present time is over \$300,000 ahead of what it was at the same date last month, and if no accident or unavoidable delay occur before the end of the month, the yield will be out short of \$3,000,000. The east drift, running in the east country rock, to connect with the O. & C. shaft on the 1300-ft level, is going steadily ahead, the face still being perfectly dry, showing almost beyond a doubt that there is an intervening body of clay between this drift and the strong body of water now being drained in the shaft.

MEXICAN.—The week has been mostly spent in driving the main drift on the 1405-ft level further to the northward, and in cross-cutting to clear the width and extent of the ore body recently struck in that portion of the mine. The prospecting shows that the ore body is undoubtedly large, and has also proven that the quality of the ore is such as to pay well for mining and milling. The full limits of the discovery cannot as yet be known, but enough has already been developed to prove that it is of great value, and the chances are that it will prove itself to be the richest and largest body of paying ore ever yet developed on the north end of the Comstock. The ore, while averaging well, has rich and poor spots, some portions assaying into the thousands, while others run quite low. The finding of a continuation of paying ore to the northward is not only a good thing for the stockholders of the Mexican, but is also a great encouragement to all neighboring prospecting claims, bringing as it does, these developments right to their very limits.

OPHIA.—Daily yield, 150 tons of ore, keeping the Empire State and Nevada mills steadily running. The Windmill mill has not yet started up, but had condition of the roads preventing the delivering of a regular supply of ore. The ore breasts are yielding well, and show no signs whatever of depletion. The new and powerful incline hoisting machinery was started up day before yesterday, everything working with the utmost perfection and smoothness.

CALIFORNIA.—The north drift on the 1550-ft level has about 20 feet yet to run to connect with the bottom of the winze now sinking below the 1550-ft level in cross-cut No. 6. Both the face of the drift and the bottom of the winze are still in rich ore. The pumps are hoisting a steady stream of about 25 inches of water, miners' measurement. They are capable of lifting 40 inches with the same case, so that there is no immediate danger of a flow that they cannot master.

COSMOPOLITAN.—The face of the main drift north, following the vein, continues in the same excellent ore which has characterized the last 30 or 40 feet, showing considerable improvement, however, as further advance has been made in the sinking of the vein. The face of the drift is now in ore which gives high assays, and heavy additions to the already well loaded dump. This main drift tunnel is now in nearly 800 feet, and cross-cutting in the good ore vein at the north end will soon be commenced.

SIERRA NEVADA.—The east and west prospecting drifts at the 1500-ft station are steadily advancing in very favorable ore, and are capable of sinking 40 inches at the 700-ft level of the north drift from the old shaft is going steadily ahead, the bottom in good working ground.

SILVER CITY.—The ore is being stoped out north and south from both upraises. The breasts are looking and yielding well at all points, giving the usual daily addition of ore to the abundant accumulation already on hand.

LADY WASHINGTON.—Very good progress continues to be made in sinking the shaft, the material met with being of the most favorable character.

SUITO TUNNEL.—Total length of the tunnel last evening, 12,613 feet. The material met with works very favorably, allowing of more rapid advancement than heretofore.

OVERMAN.—Sinking the shaft is making much better progress than for some time past, although the rock in the bottom is yet very tough and hard to blast.

KOSUTH.—The main shaft drift on the 350-ft level is steadily advancing, the face in ore which assays rich in gold. The ledge on the 350-ft level is steadily widening and showing more favorable to the southward as the drift advances.

FLORIDA.—The grading for the new and powerful hoisting machinery is fully completed and the machinery is being put in position as fast as it arrives.

SULLIVAN.—Considerable improvement is met with in the face of the east cross-cut, better quartz having been found during the week than has yet been shown at this level. It is in fine looking streaks which assay from \$30 to \$50.

DAYTON.—Both the north and south drifts on the 500-ft level are advancing in a very favorable formation, running parallel with the ledge.

NORTH OMBON.—Drifting north from the newly opened 250-ft level is actively commenced and making excellent progress. The width of the vein at this point is greater than the last above, and south of the ore assays very high, with plenty of it in sight.

GOULD & CURRY.—The excavations for the foundations for the new pumping machinery will be commenced in a very short time.

SAVADE.—The water in the shaft remains stationary at the 1300-ft level. Preparations for the erection of the new and powerful pumping machinery are going steadily forward.

WENDELL.—Mr. J. P. Hutchinson, the very efficient superintendent, is now in San Francisco contracting for steam hoisting machinery for driving the work at a much more rapid rate.

NORTH DAYTON.—The ore vein gives assays of from \$30 to \$50 to the ton, and is increasing in width.

ALTA.—The shaft has again been drained and the sinking resumed.

OWEN POINT.—Daily yield of ore, 360 tons, keeping the mills steadily running.

ROCK ISLAND.—The prospecting drifts at the 850-ft level are steadily advancing in very favorable vein formation.

EMERY.—More streaks of quartz continue coming in at the bottom of the shaft, and the prospect is that these streaks, all of which give good assays, will consolidate into a ledge of pay ore.

BEST AND BELCHER.—Repairing the main drift connecting with the Gould & Curry on the 1700-ft level is going steadily ahead, the damage to the drift proving much greater than was at first expected.

LEVATHAN.—The shaft continues in the same excellent ledge material mentioned last week, with continued improvement.

LADY BRYAN.—The south drift from the 500-ft station is steadily advancing, the face in a fine quality of quartz, grading into gold ore. The prospecting drifts on the 350-ft level are all showing well, and the west cross-cut, No. 1, is steadily developing a fine body of pay ore.

KNICKERBOCKER.—The greatest activity is exhibited both in sinking the shaft and opening the drifts on the lower levels, preparatory to cross-cutting the ore vein. Six and eight-hour shifts are employed at all points in the mine.

UNION CONSOLIDATED.—The winze now being sunk below the 1300-ft level is steadily advancing downward, cutting in its course many fine streaks of good ore. The situation of this winze is some distance west of the new ore body discovered by the north drift in the Mexican ground, so that it cannot be expected to strike the same ore body until it has reached the 1465-ft level and a drift has been run from the bottom far enough east to reach the same portion of the vein.

YELLOW JACKET.—All of the drifts are in porphyry. The cross-cuts on the 1740-ft level continue to look quite favorable.

TRJAN.—The erection of the new hoisting works building and the new steam hoisting machinery is making steady progress. About 40 men are employed on the work.

LEO.—The extraction of ore for milling was commenced yesterday. It is estimated that there is an abundance of ore in sight; enough to keep a 10-stamp mill running for eight months or more.

BALTIMORE AND AMERICAN FLAT.—The east drift on the 1050-ft level is steadily advancing, the face in very favorable ledge formation. The 1150-ft station is completed and ready to start a prospecting drift at that point.

HALE & NORCROSS.—Nothing doing in the mine on account of the flooding of the lower levels by the water from the Seave.

IMPERIAL-EMPIRE.—The north drift, on the 2000-ft level, has passed through the broken up formation of quartz and porphyry, reported last week, into a fine formation that promises the opening of a large body of pay ore.

Arizona.

ISABELLA MILL AND MINE ON BIO BUO.—Arizona Miner, March 12: Mr. C. E. Hitchcock commenced work on the Isabella mine with a small force, under Billy Gavin, on the 1st of November. They now have four shafts from 10 to 60 feet deep, and levels run 50 feet each way, showing a vein of ore from two and a half to four feet wide. They have cut out 600 tons, and are averaging two and a half tons per day to the mill. Work commenced on the mill and build up December 1st, and in 15 days the ditch, water wheel, road, etc., were completed, and in 90 days the 10-stamp mill was running with 300 tons of ore in front of the batteries. This is perhaps the quickest work in the way of mill building and mine development on record. Mr. J. J. Hill, who has had charge of the erection of the mill and water wheel, was in town on Tuesday, and reports the mill running, with snow enough in the mountains above it to insure water to keep it going for the next three months. Mr. Hill says the Isabella has developed a good mine in every shaft, and looks as fine as any vein he has ever seen. The vein is narrow on the surface, but at a depth of 25 feet and thence downward it fills the entire size of a working shaft. Nothing but milling ore is hoisted out; there is no waste. Prospect shafts along the lead for 3,000 feet show the same character of ore as that already mined.

Idaho.

THE ALTURA BONANZA.—Idaho Avalanche, March 10: In a private letter received yesterday from Rocky Bar the following reference is made to the quality and quantity of the rich rock recently extracted from the big ledge at Atlanta: "At Atlanta the Monarch company have out and sacked for shipment \$300,000 worth of ore which has been taken out this winter at a cost not to exceed \$7,000, and allowing an extreme outside limit \$10,000 for further costs of handling, shipping, reduction and commission will leave the small little sum of \$283,000. The prospects of that camp are very flattering, although for some time to come the great force of men can find employment." From other sources we also learn that Alturas is looking up splendidly, and with the expected new capital that will probably be brought in this spring, for the purpose of working up the mines on a larger scale, the most favorable results are anticipated. There is not a more promising camp on the Pacific coast.

Montana.

PLACER MINING.—Montanian, March 12: The prospects at this writing are very favorable for an early commencement of operations in the placer mines of this country. On account of the mildness of the winter the frost has not penetrated so far into the ground as of yore, and the ground is now in a very favorable condition for prospecting. The indications are that the yield from our placers during the season of 1876 will be fully up to the average of the past few years, if not actually greater, and we confidently look forward to a prospecting season for this important interest. Some work has been done during the winter months, and the sluicing of the gravel which has been uncovered will produce quite a large amount of money in a few weeks. "Ye honest miner" is hopeful and we trust to see his wishes fully realized.

Utah.

STAR DISTRICT.—Cor. Salt Lake Tribune, Mar. 19: The Big Bonanza is looking better than ever. The parties who bought it immediately put on a gang of miners and have sunk the prospect shaft to a depth of 54 feet in solid ore of a higher grade than when first struck. Work is being pushed rapidly to the surface as fast as circumstances will permit. It will undoubtedly be a second Comstock. The Wah Wah smelter, owned by Cullen & Ryan, is being removed from its original location, and is to be erected in close proximity to this huge mine. Other mines in this district are looking well. Everything hides fair for lively times in Star and San Francisco districts this spring. The smelter at Shantite is running and turning out bullion by the car load. South Camp is looking nicely and work still continues on the Rebel and other mines at North Camp. The Dike mine is improving.

SALE OF THE NEW IDRIA MINE.—The officers of the New Idria quicksilver mine took occasion last week to deny that they had sold the property, coupling the denial with the statement that they had not disposed of it to McGarraghan, the claimant in the long-pending lawsuit. It now appears that arrangements have been made for the sale of the mine on the 1st of September next—not to McGarraghan, who still presses his suit and waives nothing of his claim, but to Montgomery Blair, of St. Louis, and the price agreed upon is \$1,000,000. The deed drawn up makes an absolute disposal of the mine by the present owners, who have maintained possession throughout the protracted litigation, to Blair, upon condition that \$400,000 be paid on the 1st of September and the remaining \$600,000 be paid in five years, a mortgage at seven per cent. being taken as security.

Fortify and tone the feeble cough-torn lungs with HALE'S HONEY OF HOREHOUND AND TAR, and they will soon assume their healthy and regular action. It is an absolute safeguard against consumption. Pike's Toothache Drope cure in one minute.

WOODWARD'S GARBERS embraces an Aquarium, Museum, Art Gallery, Conservatories, Tropical Houses, Menagerie, Seal Ponds and Skating Rink.

The Uses of Aluminum.

When we consider the excellent qualities possessed by this metal, its color, brightness, unchangeableness in air, and in sulphuretted hydrogen, that it is not injurious to the health and can be worked in any shape, it seems remarkable that it has found so little use, and that the great hopes which greeted its preparation according to Deville's process are so far from being fulfilled. The price of aluminum would be considerably less if it were made in large quantities, as it depends on the price of sodium, the manufacture of which could also be conducted more cheaply if there were a certain and large demand for it. The advantages of vessels made of aluminum are not so evident and conspicuous as to be able to easily overcome old habits.

At the London exhibition of 1862, numerous articles of aluminum were exhibited; the Paris exhibition of 1868, and the Vienna exhibition of 1873 showed that the interest in this "silver from clay" had died out.

Aluminum made by Deville's process was used at first as ornaments and other articles of luxury. On account of its brightness the tubes of opera and spy glasses were made of it. In physical apparatus and all fine instruments where weight is an objection aluminum replaces other metals with advantage. Saber sheaths and dagger handles have been made of it. The eagles on the flagstaffs of the French army are about four and a half pounds lighter since they have been made of aluminum. As the metal can be drawn out to the finest wire, it has been used for embroidery, lace, fringe and other decorations. They have some advantages over the same articles when made of silver, being lighter and they do not tarnish.

Nevertheless the use of aluminum has, as we have said, greatly diminished. Aluminum jewelry is scarcely seen at the present day. Opticians still use it for spy glasses and the like. Recently it has been much employed for surgical instruments. In the atelier of C. Schmidt, in Berlin, a considerable quantity is consumed in the manufacture of splints.

Although there is no mistaking the fact that the high expectations with which the appearance of aluminum filled the public mind have not been fulfilled, yet the aluminum industry has a safe guarantee of its existence in the use of the metal for aluminum alloys, which are capable of the most extensive use on account of their excellent qualities.

Aluminum will alloy directly with most metals, generally with strong heat, which may increase up to the glowing point. Small quantities of other metals affect the properties of aluminum, while, contrawise, small quantities of aluminum change the properties of other metals.

The alloy of aluminum with copper, aluminum bronze, is of the greatest importance in the arts. According to Tissien, as little as one per cent. of aluminum, added to pure copper, considerably increases its ductility, making it more fusible, and gives it the property of completely filling the mold, making a dense casting, free from air bubbles. At the same time the copper becomes more capable of resisting chemical reagents, increases in hardness without losing malleability, and unites in itself the most valuable qualities of bronze and brass. The color of the alloy is almost a copper red.

A copper alloy with two per cent. of aluminum is used in the studio of Christofle, in Paris, for works of art. It works well under the chisel and graver.

The true aluminum bronzes, namely alloys of 90 to 95 per cent. copper with 10 to five per cent. aluminum were first made (says R. Wagner) by John Percy, in 1855. They became generally known through the researches of Deville.

For the preparation of this alloy, perfectly pure copper must be employed. If to a quantity of melted copper there be added one-ninth its weight of aluminum, the two metals unite energetically, with the evolution of so much heat that the crucible, if it be not exceedingly refractory, softens and sinks together. The bronze obtained is at first very brittle, but by frequent remelting increases in strength and ductility; the right degree is determined by hammering out a piece after each fusion. As a rule, two or three refusions suffice. Probably the amount of aluminum sinks somewhat below the original 10 per cent. Aluminum bronze with five or 10 per cent. aluminum possesses a color very like that of gold. The alloy with 10 per cent. has the color of green gold, an alloy of gold and silver. The alloys polish beautifully, make perfect castings, and possesses great strength; according to Anderson's experiments, an average of 75,618 $\frac{3}{4}$ pounds per square inch. They are also very flexible, and, at temperatures from a dark red heat to near the melting point, perfectly malleable. The castings are perfectly sharp, and can be worked more easily than steel. This bronze engraves nicely, is easily rolled into sheets, and offers greater resistance to the air than other bronze, brass, silver, cast iron, and steel.

These excellent qualities give it a number of uses. In the construction of physical, geodetic and astronomical instruments, it is far preferable to all other metals. In jewelry and articles of art and luxury, it is employed in large quantities. Many kinds of house utensils are made of it, and it is also adapted to journal axle boxes. Gun and pistol barrels, as well as rifled cannon, have been made of it, and have done excellent service. At present the high price of aluminum bronze alone prevents its general use for arms. Morin (who has probably gone out

of the business now) furnished these bronzes at the following rates: 10 per cent. aluminum, \$6.60 per pound; 7 $\frac{1}{2}$ per cent. aluminum, \$5.50 per pound; 5 per cent. aluminum, \$4.40 per pound.

These prices are four or five times as much as tin bronze. In articles where the price of the raw material is of little consequence as compared to the value of the work, as in physical instruments and the like, the aluminum bronze is always to be preferred.—*Iron and Metal Review.*

The University's Needs.

The Special Committee of the Board of Regents, composed of Messrs. H. H. Haight, John B. Felton, W. T. Wallace, J. West Martin, and S. B. McKee, have issued a memorial to the Legislature setting forth the wants of the University. One hundred thousand dollars are needed for the erection of the central portion of a large building for the library and museum, for the Secretary's office, and for additional class-rooms. Ten thousand dollars are required for a wooden building for an auditorium, drill-room and armory of size sufficient to accommodate not less than 1,000 persons. Forty thousand dollars are asked for the erection of a plain, substantial building of brick, 70 feet by 50 and two stories in height, for the Department of Mechanics and Mining. Twenty thousand dollars are wanted for the increase of the water supply to the University buildings and the agricultural grounds. Ten thousand dollars are needed for out-of-door agricultural operations and experiments on the grounds; \$5,000 for the purchase of books for the library; \$10,000 for the improvement of the grounds, and \$60,000 to meet the deficiency between the current expenses of the University and its income. The aggregate sum asked for is \$257,000. In asking for these appropriations the Regents say they are absolutely necessary to maintain the University as the leading educational institution of the State. At the time of the last legislative session the number of students was about one-half of the whole number now in attendance, and before another Legislature convene, should the buildings and other assistance herein be granted, the number will probably reach, and may exceed 600.

THE MINERS' RIGHTS.—The Sacramento Bee discusses the relative rights of miners and cultivators, saying: "It would appear that the miners have the legal as well as the natural right to turn their waste waters with all their burdens into the natural channels or rivers of the country, but that they have not the right to turn them into new or unnatural channels, if by so doing they injure any person or property. When put into rivers they are in their proper place, and those residing on the banks of the stream do so at their peril—or, in other words, take all risks; but when, as in Butte county, the miners throw their tailings out on to the plains through artificial channels, injuring farms, they are evidently trespassing and should be made to pay damages. And the miners themselves recognize this fact, inasmuch as they have in many instances paid for the land so injured. The legislative commission, which is likely to be appointed to investigate the subject and report thereon two years hence, may be of future use; but what is to be done in the meantime? Nothing that we can see, and the past will be repeated."

THERE seems no good reason why the placer mines do not exist south of the Montana diggings on the same belt of country, which corresponds with Wind river section, but we do not believe that anything more than average wages will result from the Constar City affair so far to the eastward of the main Rocky mountain range. At all events, the rush is so far under way, and the military job so fully matured, that the entire country in question is destined to be overrun the present season. It will probably be the last ditch of the American Indian. He is driven into a corner and must go to the wall, and probably the sooner the Black hill game is played out, the better for all concerned. Ere the end of 1876, we look for a reorganization of the map, and "Centennial" Territory created out of Dakota, Montana, Wyoming, etc.—*Lyon County Times.*

TEN MILLIONS IN SILVER.—Probably but few persons have any adequate conception of what \$10,000,000 in silver bullion in one mass would be like. That is the pile that Messrs. Flood & O'Brien propose to exhibit at the Centennial exhibition. This mass of silver would make a solid block 10 feet long, 10 feet thick and eight and one-tenth feet broad, containing 810 cubic feet. One cubic foot of fine silver weighs 727 pounds, and is worth about \$12,000. Ten millions of dollars' worth of silver, therefore, would weigh 588,919 pounds, or nearly 294 $\frac{1}{2}$ tons. Ten tons is usually considered a carload; so it would require a train of nearly 30 loaded freight cars to transport this treasure across the continent.

OVER 250 houses have been erected at Custer City, in the Black hills, and as many more are in course of construction. One sawmill is already running, and two more are en route from Cheyenne. Lumber is selling at \$50 a thousand, flour at \$12.50, coffee at 50 cents, and other things in proportion.

THE Queen of the West mine, on Democrat mountain, Colorado, has been sold to parties in Burlington, Iowa, for \$100,000.

A TAX is proposed on gold and silver.

Mining in Trinity County.

A correspondent of the *Bulletin* writes from Indian creek, Trinity county, as follows:

Trinity county is not far, if any, behind the other counties in improved hydraulic machinery. Perhaps the most completely rigged claim here is James Johnston's. It consists of about 100 acres, a bar on the south side of Indian creek, averaging in depth about 50 feet, and is over a mile in length, and 600 feet wide. There are two "giants" on this claim, one 11-inch outlet, with a 6-inch nozzle, and one 9-inch outlet, with a 4 $\frac{1}{2}$ -inch nozzle, supplied by a main trunk of 22-inch pipe, 600 feet long, which reaches the bedrock, where it divides into 11-inch and 15-inch pipe, running four or five hundred feet further. There are two flumes, a 4-foot one for the larger giant, and a 3-foot one for the smaller one. They are lined with 8 $\frac{1}{2}$ -inch blocks, each flume carrying between two and three thousand inches of water. It requires two large ditches of the capacity of four and six feet width by three in depth to supply this claim with water, and even then he has to use two reservoirs, one of which is 600 feet long by 50 in width.

Smylie & Trotter's claim at Douglas City has a hydraulic giant, with a 15-inch outlet, 8-inch nozzle, and 22-inch pipe. This machine has been in use two years. This is a good claim. They have been running night and day, having made two clean-ups, amounting to about \$10,000. Their flumes are four feet wide and three feet deep, lined with 8-inch blocks.

Marshall & Mason's claim at Union Hill has two little giants—size, No. 1. On this claim they have been running tunnels for about a year. Commencing at the Trinity river, they run the main one about a thousand feet, from which they run branch tunnels in different directions. Some of the branches are as much as 50 feet beneath the surface of the channel bedrock, from which they raise shafts to the bottom of the gravel, through which, when the surface is worked off, they sluice. A few days ago, in one of the branch tunnels, they struck a new channel about 40 feet wide with perpendicular walls 10 or 12 feet high, and which, they say, prospects throughout from \$1 to \$1.25 to the pan. Mr. Trotter, our ex-County Clerk, who owns a one-fourth interest in this mine also, says that he wouldn't give two hits for any one to insure him \$10,000 for his share of the dividends.

Weaverville is all life; everybody is resting and smiling; even the saloon keepers have ceased to stand in their doors to take the measure of strangers as they come up Main street, to see if there is a probability of their having a spare "piece" about them. There are some good claims here, among which may be mentioned those of our ex-legislator McMurry and Davison & Jenkins. The former has a giant machine, and pays well. The latter is in the bed of Weaver creek, and has a flume that takes the water of all the claims in Weaver basin, being 16 feet in width, with 9-foot frames, on which are 6 foot sides, and is over half a mile in length. It takes 42,240 superficial square feet of blocks to line it, which cost at the ordinary price of \$3 per 12 feet of a 3-foot flume, \$3,500. Mr. Davison has a sawmill, and furnishes his own and other claims with blocks and lumber.

AN EXPLODED CONTRACT.—On Friday last Judge Wheeler granted the motion for transferring the case of Joseph Haffenecker against Donald Bruce to the United States Circuit Court. The suit was brought to recover \$3,000 alleged to be due on a contract for the manufacture and sale of a certain explosive compound. Bruce alleges that the compound was known and rejected many years ago in Europe, and is so dangerous withal that it cannot be put to any practical use in mining. It was ruled that a State court does not possess any jurisdiction to examine into the validity of letters patent, and that, therefore, in order to meet the points of the dispute in the present case it was only just and proper that the United States Circuit Court should deal with it.

THE location of the Lick Observatory and telescope on the summit of Mount Hamilton, and the construction of a carriage road thereto from San Jose, has stirred up the Stanislaus county people to building a road from the west side of the San Joaquin valley to the summit, thus making a direct route to the Yosemite valley, without the long detour now necessary. The Stanislaus county finances are now so low that the county can do nothing about it for some time to come, but it is expected that a private company will soon start the work.

A NOC fell into the hulkhead which supplies the water for the hydraulic pipe in the Blue Tent Consolidated mining company's diggings at Nevada City, the other day, and was forced through the pipe and out of a five-inch nozzle, bringing up against the bank several hundred feet distant in a very demoralized condition.

DAN DE QUILLE, of the *Virginia Enterprise*, for whose forthcoming book much inquiry has recently been made, has received a telegram from Mark Twain stating that it is nearly ready for delivery, and that canvassers will soon be bent in the field. The name of the book is *The Bonanza*.

A STEAM HAMMER weighing 13,000 pounds has arrived in Virginia City for the Savage mine. It will be set up in the company's machine shop.

Mining Then and Now.

The Grass Valley Union, reminded of old times by the late severe storm, indulges in some reflections, and gives a little good advice, as follows:

Twenty-one years ago this winter the rains were welcome, because then the "dry diggings" wanted water, and the miners on Wolf creek wanted water; the Jenny Lind diggings awaited water for washing purposes, and Alta hill had to have water in order to clean up the gravel that was piled above ground before it could turn out the gold dust. In those old days men used to go out after a heavy storm and find great big nuggets of gold. In those days the Grass Valley miner, clothed in rubber, did not lose a minute of the day while the rains fell. That old time miner did not stay around a stove and play pedro. He worked. Now the miner does not risk his health in pursuit of gold. He has more philosophy. He now knows that the chief end of man is not to accumulate the yellow dross (it is powerful to have even now), but that a pleasurable afternoon can be spent while the full sluice heads of water are running to waste. One reason of this reform is that there is not now as much gold in the gravel as there used to be. Hence the sweep of pedro for sluicing. Pedro pays better just now. In the old days, when the gold had not been all taken from the grass roots, the finding of big diggings was the more exciting sport. But our boys ought to go out and find some ledges. Those ledges are going to pay, and they furnish the sinews of war wherewith to fight pedro in the future, or they may do better still and give the means for travel and cultivation. Locate ledges in spite of storms.

NEW GALENA BELT.—A correspondent from Ellsworth, Nye county, Nev., announces the discovery of a rich galena belt, eight miles west of that town, which runs north and south, and is 40 feet in width. Three locations of 1,500 feet each have been made, the middle of which, called the "Illinois," is reported to have turned out \$4,650 from 10 tons, bringing to the owners at the mine a net profit of \$310 per ton. Ore assaying as high as \$1,000 is reported in sight, and the whole belt is said to assay 65 per cent. of silver and 35 per cent. of lead to the ton. Mr. McGee, of Tyho reputation, is reported to have offered \$70,000 coin for a portion of the claim. The ore is in easy working ground, with plenty of wood and water at hand. Several other mines are being opened up in that neighborhood, and a 20-stamp mill will soon be a necessity.

THE MINERS' UNION AT EUREKA.—Superintendent Rickard publishes a letter in the *Eureka Sentinel* of the 15th, denying that he had, in behalf of the Richmond company, yielded to the demands of the Miners' union. He says, on the contrary, that after hearing from representatives of the union that they would, in future, not allow non-union men to work in the mine, nor contracts to be given for taking out ore, he came to the conclusion that it would be better to shut down the mine than to submit to any such dictation. Mr. Ratcliffe, president of the Miners' union, desired it to be understood that for the remainder of this month and for 30 days thereafter, they can employ whom they please; but at the expiration of that time all miners will be required either to become members of the union or quit work.

A LARGE party of mounted Indians made an attack upon the suburbs of Custer City in the Black hills, March 4th, driving off all the loose horses grazing in that vicinity, and at the same time made a dash at an emigrant train, nine miles below, killing one man—Charles Holt, of Sioux City. A party of 60 well armed men at once collected at Custer, and went in pursuit of the savages, but with what result is not yet known.

UNIONVILLE ITEMS.—The Arizona mill, which has been shut down for some time, in consequence of the scarcity of fuel, will start up next Monday. A rich strike, one of the old time bonanzas, is reported to have been made in the Arizona mine. The old camp, like many others, has been quite dull this winter, but is recuperating and promises to be as lively as ever next summer.—*Silver State.*

THE machinery for a wooden bowl factory is now in Seattle, and will probably soon be put in use. It is intended to erect a building near Nation's foundry, and have this machinery in it and in use about a month. The bowls will be made of maple and alder, six from a block, six at a time, six in eight minutes and six of different sizes. This will be the only factory of the sort on the coast.

THE widow of the late Sandy Bowers predicts that Reno, Nevada, is to be the most important city on this coast, excepting San Francisco. Very rich mines are to be discovered there. The Nevada Journal says she predicted the late discovery of quicksilver.

SILVER CITY, Idaho, is excited over the discovery on Siuker creek, seven miles from town, of a large mica ledge of excellent quality, some of the plates taken out being from four inches to two feet cross.

THE military authorities at Fort Laramie allow emigrants to go on to the Black hills without molestation, if organized in parties of 20 or more and properly armed.

USEFUL INFORMATION.

Mending Tin-Ware.

Faith Rochester, in the *Agriculturist*, describes a method of soldering which we have long used, and can recommend it to all our readers. It is essentially as follows:—Get an ounce of muriatic acid, put it into an old tea-cup or bowl, and throw in a few small pieces of zinc, such as you can pick up at any tinner's. After it has ceased to effervesce, turn into a bottle and use a small stick to apply the liquid to the tin. Scrape the tin clean and bright around the place to be mended, rub some of the liquid on with the stick, lay on a piece of solder, and hold it over a lighted candle till it melts, and the job is done.

We use a small soldering iron, and much prefer it to the candle plan. A soldering iron can had for 25 cents that will answer every purpose; 10 cents' worth of solder will last a year in an ordinary family, and the muriatic acid will not cost any more. What a tinner or traveling tinker would charge for a single job of mending will buy a complete outfit, and then you are done with the annoyance of leaking vessels, or being compelled to work without them, at a great disadvantage. With farmers who live some distance from town, the soldering outfit is one of the greatest conveniences—with us it is indispensable. We keep the iron, solder and fluid (the latter well corked except when in use) in a box by themselves, on a shelf out of the reach of children. The muriatic acid is a very powerful corrosive agent, and must be handled with extreme care. Children must not be permitted to get hold of it. Several years ago we bought a bottle of soldering fluid of a man who was traveling around selling it—at 50 cents per bottle. Not long afterwards we got hold of the above recipe for making precisely the same thing—at a cost of 10 cents instead of 50.

RUSSIAN MANUFACTURES.—The Russian edge tools differ from those of other countries in some peculiar respects. The common spade, for instance, is made chiefly of wood and simply tipped with iron; it is of small size, rounded at the edge, and has a plain curved handle. The axe is much larger than that manufactured by other nations, and is used, too, for all kinds of carpenter's work—answering, in fact, as a plane, a hammer, and even as a saw, the last tool being rarely used by the Russian mechanic, for he can wield the axe more easily, and cut through thick logs of wood with incredible precision and rapidity. Samovars are a leading article of the Russian metal industry, these being a kind of tubular boiler, with little charcoal furnaces, and are used for making tea; the material is copper, which is almost exclusively used among the well-to-do classes for cooking utensils, tinware, hollow cast-iron vessels and pewter being but little in vogue. Horse-shoes are produced by hand at the rate of some 30,000,000 annually. Bell-making is carried on with especial success, the bells being remarkable for their immense size and richness of tone. Harness fittings of European pattern are made, but only in very limited quantities, those which are used upon Russian harness being of considerably different construction.

SUPERIORITY OF WOOD SCREWS OVER NAILS.—Most mechanics who work in wood do not appear to understand the eminent superiority of wood screws over brads and nails. In many places one screw is worth three or four nails. When one is securing cleats to batten doors or cleats to a wagon-box, nails are very unsuitable when compared with the efficiency of gimlet-pointed screws. Screws will hold two pieces of wood more rigidly than nails; and if the timber should shrink a trifle the screws can be turned up tight; whereas it is difficult, in most instances, to tighten up loose work with nails in all places where there is an unusual strain on the parts to be held together.

COW HAIR AS A SUBSTITUTE FOR WOOL.—There is now being manufactured in England a class of goods known variously as veloms, Ulster coatings, chinchillas, etc., alleged to be made of hair and vegetable fiber, without the admixture of wool in any shape. These goods are finding their way into the United States, and the custom house authorities are not a little puzzled as to where to place them, when scheduling them for duty. Testimony of experts was called in; but it was only another case in which "doctors disagreed." The solution of the problem has been made the duty of the National Academy of Sciences.

"It took that German savant just 14 years to make an egg and hatch the same, but it will take him just twice that long to convince us of the fact." Allowing that it is a fact, we fail to see the economy of the new method. Had the savant invested fifty cents in a motherly old hen, he could have had more eggs, a more numerous hen progeny, and something over to pay for the wear and tear of the hen.

RATS that live in granaries are said by a professional rat catcher not to be poisonous, while those that live on refuse meat inflict painful wounds. This is another argument in favor of the vegetarian theory, and every pious family should keep a granary.

An invention has just been patented by which the gas from coal stoves may be utilized for lighting the various apartments of a house.

Utilization of Cobwebs.

Cobwebs have been applied to various uses. The delicate cross-hairs in the telescopes of surveying instrument are fine webs taken from spiders, a species that are specially selected for their production of an excellent quality of this material. The spider, when caught, is made to spin his thread by teasing him from hand to hand, in case he is indisposed to furnish the article. The end is attached to a piece of wire, which is doubled into two parallel lengths, the distance apart exceeding a little the diameter of the instrument. As the spider hangs and descends from this, the web is wound upon it by turning the wire around. The coils are then gummed to the wire and kept for use as required. About a century ago, Boa of Languedoc succeeded in making a pair of gloves and a pair of stockings from the thread of the spider. They were very strong and a beautiful gray color. Other attempts of the same kind have been made; but Renumar, who was appointed by the Royal Academy to report on the subject, stated that the web of the spider was not equal to the silkworm, either in strength or luster. The cocoons of the latter weigh from three to four grains, so that 2,304 produce a pound of silk; but the eggs of the spider, when cleaned, do not weigh above the third part of a grain, so that a single silkworm can accomplish the work of 12 spiders.—*American Cyclopaedia*.

THE TINNING OF BRASS OR COPPER ARTICLES. Nearly all the known recipes for plating articles with tin are attended with the inconvenience of not giving the proportions of the substances to be employed for this operation. If, as is commonly done, very concentrated solutions are employed, tinning is not produced. If they are too diluted, the tinning is slight. Numerous experiments have proved that the following formula produces excellent results: Dissolve 10 grammes (about 6½ dwts.) of tartaric acid in a liter (about 1½ pint) of very soft distilled water; boil this solution, plunge in it the articles to be tinned, and add 10 grammes (about 6½ dwts.) of fine granulated zinc. This granulated zinc may be easily prepared by shaking fused zinc in a box coated with chalk. Then care must be taken to turn the articles to be tinned several times, and replace the water which evaporates. At the expiration of a short time the tinning commences, and the articles in the bath must be continually turned over till the required degree of tinning has been obtained.—*Le Technologiste*.

LEATHER BLACKING.—An excellent blacking for leather may be made thus: Dissolve 11 pounds of green vitriol and five pounds of tartaric acid in nine gallons of water. After the settling draw off the clear liquid; then boil 16 pounds of logwood with about 18 gallons of water and 11 gallons of the fluid. Let the boiled mixture stand for about eight days, pour it off from the sediment, dissolve in it two pounds grape sugar, and mix this liquid with the green vitriol solution. The blacking so obtained may be made still brighter by mixing the logwood decoction with four pounds of aniline black-blue before the addition of the vitriol. The application of the blacking is very simple. The leather is first well brushed with a solution of soda, or still better, with spirit of sal-ammoniac, in 25 times as much water, to get rid of the grease. The blacking is then applied with the proper brush for the purpose.—*Stummer's Ingenieur*.

WEAR AND TEAR OF RAILROAD TRAINS.—It is estimated that every time a train of cars of the average length stops, it costs in wear and tear of material and loss of power, fully 75 cents. This is what makes a conductor always look so cheerful when he hauls up at a flag station, in the middle of a snow storm, to take on a string of onions and a man with a dead-head pass.

GOOD HEALTH.

Toothache and its Remedy.

EDITORS PRESS:—While looking over your valuable paper this morning, my attention was attracted to an article headed, "Bicarbonate of Soda a Toothache Remedy," and, with your permission, I will say a few words through your paper in favor of this useful remedy, not with the intention of claiming anything for your correspondent, but to say that years of experience has convinced us that Dr. Buckwith's opinion is certainly correct. Having suffered many years with severe attacks of toothache I am happy to throw any light on the subject that I can.

About 15 years ago, while suffering severely from an attack of this kind, after trying everything I could hear of without any good effects, I resolved to try an application of cold water—as the aching was accompanied by a burning sensation—which I did by filling the mouth with cold water. In about one minute the pain was gone; but as soon as the tooth would get warm the pain would commence again. Then remembering that bicarbonate of soda was of a cooling nature, I determined to try it, and as the tooth was a mere shell I filled it with this article, which of course came directly in contact with the diseased nerve. The result—as quick as thought the pain was all gone, and as the taste produced was something like that which

we get by mixing different kinds of alkalies and acids together to make summer drinks, I inferred at once that the pain was caused by the acid saliva coming in contact with the nerve of the tooth. I have always used it since, and have recommended it to hundreds of others who have used it with the same results. There are two kinds of toothache—one of which, only, the soda will relieve. The desired application can be determined by taking first cold and then warm water in your mouth; to the one relieved by the cold water apply the soda, as directed; to the one relieved by the warm water apply oil of cloves, pain killer, camphor or some such hot & stimulating remedies.

Contra Costa Co., Cal.

A SUFFERER.

EXPANDING THE LUNGS.—Step out into the purest air you can find; stand perfectly erect, with the head well up and the shoulders back, and then fixing the lips as if you were going to whistle, draw the air, not through the nostrils, but through the lips, into the lungs. When the chest is about half full, gradually raise the arms, keeping them extended, with the palms of the hands down, as you suck in the air, so as to bring them over the head just as the lungs are quite full. Then drop the thumbs inward, and after gently forcing the arms backward and the chest open, reverse the process by which you draw your breath till the lungs are entirely empty. This process should be repeated immediately after bathing, and, also, several times through the day. It is impossible to describe to one who never tried it, the glorious sense of vigor which follows this exercise. It is the best expectorant in the world. We know a gentleman, the measure of whose chest had been increased by this means some three or four inches during as many months.—*Home Journal*.

CURE FOR DIPHTHERIA.—The ravages of diphtheria in Australia have been so extensive within the last few years, that the Government offered a large reward for any certain method of cure; and among other responses to this was one by Mr. Greathead, who at first kept his method a secret, but afterwards communicated it freely to the public. It is simply the use of sulphuric acid, of which four drops are diluted in three-fourths of a tumbler of water, to be administered to a grown person, and a smaller dose to children, at intervals not specified. The result is said to be a coagulation of the diphtheritic membrane and its ready removal by coughing. It is asserted that where the case is thus treated, and has not advanced to a nearly fatal termination, the patient recovered in almost every instance.

ADMINISTERING MEDICINE.—When a teaspoonful of any medicine is prescribed by a physician, it should be borne in mind that the quantity meant is equal in volume to 45 drops of pure water at 60 degrees Fah. It is a good plan to measure off this amount in water in a small wine-glass, and mark on the latter the exact height of the fluid. This will give an accurate and convenient standard for future use. Teaspoons vary so much in size that there is a very wide margin of difference in their containing capacity. It is well to remember, also, that four teaspoonfuls equal one tablespoonful or half a fluid ounce. A wineglassful means four tablespoonfuls, or two fluid ounces; and a teacupful, as directed by cookery books, indicates four fluid ounces or one gallon.

KEEPING THE HANDS SMOOTH.—A writer in the *American Grocer* says that glycerine is not used in the right way. She asserts that to preserve the smoothness and softness of the hands, keep a small bottle of glycerine near the place where you habitually wash them, and whenever you have finished washing, and before wiping them, put one or two drops of glycerine on the wet palm and rub the hands thoroughly with it as if it were soap, then dry lightly with a towel. Household work and bad weather will not prevent your skin from being smooth and soft, if this plan of using glycerine is followed.

The skins of fruit, especially grapes, are often swallowed with the vague notion that they promote digestion, or the idea that they prevent any bad effects from eating said fruit. No error can be more fatally absurd. Cases have occurred where such practices have been the cause of death, and that of the most excruciating nature. The skins of fruit contain no nourishing qualities, but are one of the most indigestible substances that can be swallowed. They pass the stomach without any change, although they cause excessive irritation, and frequently inflammation of the bowels.

BIRDS CARRYING CONTAGION.—The Elgin, England, *Courant* records the fact of a pigeon having been lately shot near the city which has been declared by veterinary surgeons and competent medical authorities to have been evidently affected by foot-and-mouth disease at the time of its death. The body of the unfortunate bird has, it is stated, been sent to the Veterinary department of the Privy Council office for examination, in the hope some new light may thereby be gained relating to the spread of this disease among cattle.

TROCHES.—Every one can make his own troches by following this recipe, given in the *Household*: One ounce pulverized cubebs, one ounce pulverized licorice, one ounce pulverized gum arabic, one-half pound pulverized sugar; just water enough to moisten; warm slightly, stirring constantly; roll thin, cut out with a thimble, and dry.

DOMESTIC ECONOMY.

RICK CROQUETS.—Bake a quarter of a pound of best rice in a pint of milk until well swelled and dry. While hot beat in the yolks of ten eggs, three ounces of sifted sugar and a little grated lemon peel, or any flavoring preferred. Spread this on a dish to the thickness of half an inch and let it remain until cold. Then put a few finely sifted bread crumbs on your hand; take as much of the rice as will heap a dessert spoon, put it on the crumbs in your hand and roll into the shape of an egg. Beat up an egg, white and yolk, dip the croquet into it, roll it in bread crumbs, put in the wire basket. Repeat this process until all your rice is used, then fry the croquets in plenty of boiling fat. Clarified drippings answer well for frying these croquets. Care, however, must be taken that the fat is the right temperature, which may be readily ascertained by plunging a piece of bread into the fat. If the bread browns instantly the fat is ready. Dip in your wire basket containing the croquets, move about gently in the fat, and when they acquire, as they should do in less than a minute, a golden color, they are done. Put them on white paper to absorb any fat clinging to them, sift sugar over and serve.

BAKED APPLE PUDDING.—Set a quart of milk over night, take off the cream in the morning, and heat your milk in a spider to a boiling point. Wet two dessert spoonfuls of corn starch in a little cold milk and stir into it, and continue stirring till it thickens. Set it off from the fire. Beat together two eggs and a half cup of white sugar; then pour your corn starch into this, stirring it together carefully, and add a teaspoonful of salt. Pare and slice thin six large pleasant apples; lay them into your pudding dish, pour the custard over them and bake for an hour, or until the pudding is tender. For sauce, add sugar, nutmeg, and a little extract to the cream. This is a very economical and delicious pudding.

A CLEANSING AND RENOVATING POLISH.—Take of olive oil one pound, of rectified oil of amber one pound, spirits of turpentine one pound, oil of lavender one ounce, tincture of alkanet root one half ounce. Saturate a piece of cotton batting with this polish, apply it to the wood, then, with soft and dry cotton rags, rub well and wipe off dry. This will make old furniture in private dwellings, or that which has been shop worn in waterworks, look as well as when first finished. The articles should be put into a jar or jug, well mixed, and afterward kept tightly corked. This is a valuable recipe.

PUMPKIN PRESERVES.—A writer who has tried it says to preserve pumpkin take seven pounds of pumpkin, five pounds of sugar, four lemons and two ounces of green ginger root. Cut the pumpkin in slices half an inch thick, in any desired form, square, round or diamond shape, and boil in the syrup till tender, then take up the pieces. Slice the lemon and ginger root very thin and scald them in a little clear water, after which add them to the syrup; boil the latter down until it is clear enough to keep without fermenting and then add the pumpkin to it.

TO CLEAN GARMENTS.—Wet a sponge in warm water and squeeze it out till dry; then sponge one place after another until all the garment has been cleansed. All the dust and soil will be absorbed by the sponge. But if the garment is very much soiled wash the sponge in clean water several times, squeezing it as dry as possible by wrapping it in a piece of black alpaca. This method of cleansing is more effectual than a hand brush, and many spots will disappear by the use of pure water.

RENOVATING BLACK KINS.—Ink and sweet oil mixed, two parts ink to one part oil, will also make a nice glossy blacking for glove kid boots. Prepare a bottle of it, and attach a small sponge to the cork, as is done in "liquid blacking." The same varnish touched on very gently to the white tips and seams of worn black kid gloves, will make a pair quite respectable for either traveling or shopping.

TO RENOVATE BLACK SILK.—Grate three or four large potatoes into water, and strain off the water after letting it come to a boil. Then put an old dark colored kid glove into it, and boil for ten minutes. Sponge over the breadths of the dress with the glove, and when damp enough to iron well, press on the wrong side with a flat iron not too hot, so silk scorches easily.

TO BAKE BEANS.—Prepare them as for stewing, and place them with a large quantity of water in a stone-ware pot in a hot oven. Let the oven cool somewhat after they begin to cook, and bake them from four to six hours rather slowly. Leave out meat and butter, and trim with cream and salt.

TAR SPOTS.—Butter will remove tar spots. Soap and water will afterward take out the grease stain.

TO REMOVE PAINT SPLASHED UPON WINDOW PANES, use a hot solution of soda and a soft flannel.

KEROSENE and powdered lime, whitening or wood ashes, will scour thus with the least trouble.



W. S. EWES.....SENIOR EDITOR.

DEWEY & CO., Publishers.

A. T. DEWEY, GEO. H. STONG
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Office, No. 224 Sansome St., S. E. Corner
of California St., San Francisco.

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Our latest forms go to press on Thursday evening.

San Francisco:

Saturday Morning, March 25, 1876

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GOOD HEALTH.—Toothache and its Remedy; Expanding the Lungs; Cure for Diphtheria; Administering Medicine; Kissing the Head Smooth; Birds Carrying Contagion; Cures, 199.

DOMESTIC ECONOMY.—Rice Croquets; Baked Apple Pudding; A Cleansing and Renovating Polish; Pumpkin Preserves; To Clean Garments; Renovating Black Kicks, 199.

GENERAL NEWS.—General News Items and Miscellaneous Paragraphs, on 201 and other pages. MISCELLANEOUS ARTICLES.—Heat and Mechanical Force; The Contract System of Mining; From the Black Hills; Japanese Gold; The Production of Arsenic in Copper Mines; Prospecting for Sulphur at Steamboat Springs, 194. The Uses of Aluminum; The University's Needs; The Miners' Rights; Ten Millions in Silver; Mining in Trinity County; An Exploded Contract; Mining Then and Now; New Glens Belt; The Miners' Union at Eureka; Unlabeled Items, 198. The Government and the Black Hills; The White Pine Tunnel, 202. A Mica Bonanza; The Mines of Nevada, 206.

NEW ADVERTISEMENTS.

Mariposa Land and Mining Co.—Sale; Eureka Stone Manufacturing Co.—Assessments; Stockholders Meeting; Eureka Stone Manufacturing Co.

In the Consolidated Virginia mine there is no prospecting being done at this time, nor is there likely to be any until the C. & C. shaft is sunk to a sufficient depth to drift to and open the 1600-ft level. This will not probably be accomplished until late in the summer, as the shaft will have to be sunk to a depth of 1,400 feet or over before commencing to drift.

MR. FRYER, of "Fryer process" fame, is in town. We are promised a description of the whole process at a very early date.

The crowded state of our columns prevents us publishing several articles of interest this week.

We will answer the queries of several correspondents on the subject of "Tellurium" next week.

An inquiry on the subject of quicksilver mining will be answered in our next issue.

Our Mining Engineers.

In last week's issue we gave the details of the arrangements made for entertaining mining engineers from abroad who come to America to the Centennial exhibition. It is greatly to be hoped that the results of this general conference of mining engineers will be not only to elicit information of value to the mining community, but that it will also establish among the mining engineers of America more of an *esprit du corps* than now exists. There is, perhaps, no class in the United States which exhibits so little tendency to affiliation as the mining engineers. We speak more particularly of those on this coast, although we understand that the peculiarity is only a degree less marked elsewhere. Among us the mining engineers seem to have little in common. They are employed by this one or that one, make their reports to their employers, and keep their knowledge strictly to themselves. Of course if they are paid for a report no one expects them to divulge its secrets; but there are many matters of general interest which it would violate no honorable principles to make public, and which would be of value to the mining community.

Our mining engineers have abundant opportunity for observation, and an immense field to go over, but whatever they glean they keep for themselves. Metallurgical secrets are jealously guarded from professional brethren, and nothing is given up for the common good. Few of them—we may say none of them—ever write a line for the public prints, or turn aside in the slightest degree to prevent mistakes being made, which a word from them might obviate. We never hear any hints from our mining engineers as to improvements which could be made in metallurgical or mining operations, or do we ever hear of one offering any advice which is not paid for, and paid for well. All with whom we have ever conversed on this subject confess that there is a lack of *esprit du corps* among them. There seems to be a sort of jealousy or something very like it which pervades their intercourse. When one makes a report which by any means becomes public, the others pick it to pieces and find all they can to condemn. If one makes a blunder in a report, and subsequent explorations prove the incorrectness of his theories, all the others remember that particular report, and ignore others in which he was more fortunate in his conclusions.

Several times has an attempt been made to organize a society of mining engineers in this city, but this same spirit has thwarted the efforts of those who in good faith were trying to break up prejudice among their professional brethren and establish more amicable relations. A society came near being organized this winter, but no agreement could be consummated which would suit everybody as to the meetings and the manner in which they should be conducted. Some were for social informal gatherings where those in the field could impart to the others results of recent investigations, while others preferred a perfectly organized society, full set of officers, formal reading of papers, etc. Some were for forming an engineering section of the California Academy of Sciences and some for an independent society.

Over these questions there was such a difference of opinion that part would not join or lend aid or support, except to a formal society; while others would do nothing unless the meetings were informal, and partook of a more social character. Several meetings were held to settle the questions, and it was finally agreed—no, not agreed, but decided—that they should join in the Academy of Sciences and form an engineering section, as is the custom in other countries with similar societies. And in accordance with this resolution a number have joined the Academy, but a still larger number did not join. Whether an independent society will be formed or not, we do not know, but the "social" part of the crowd were firmly resolved to preserve the social features, to do which another society will have to be organized.

All this is much to be regretted. The proceedings of no other society on this coast would be read with more interest than those of the mining engineers; but the society should not be made up of any chosen few, but should constitute a body in which all the mining engineers of the coast have a voice. There are some who are eminent in their profession, who now turn a cold shoulder to others who perhaps have equal ability but less chance to display it. These more humble gentlemen naturally stand on their dignity as to their professional rights, and are perhaps unwilling to concede as much as they should. There are still others calling themselves mining engineers, whom both of the classes mentioned ignore entirely.

There is no doubt in the world that a good many assume the title of "mining engineer" without proper authority, and without even the knowledge or intelligence to carry out the assumed character. It would be to the advantage of the mining community to know these pretenders by name, but they have no means of finding out. If a society were organized on a proper basis, it would give a professional standing to its members which no prudent man would fail to avail himself of. Once established it could keep without the pale of recognition those whose merits did not equal their pretensions, and would soon rid the profession of persons who bring it into disrepute. With this would come emulation among the members to preserve the good name of the society and the

dignity of its proceedings, an *esprit du corps*, which is now wanting, a zeal for original investigation, a desire for the dissemination of information of value to the mining community, and a more healthy congenial feeling than now exists. Try it, gentlemen! Be less reserved in your communications with each other, and give the world a chance to know that there are as smart and intelligent a set of mining engineers on the Pacific coast as can be found elsewhere.

The New Almaden Mines.

The quicksilver mines and reduction works of New Almaden are 15 miles south of the city of San Jose, Santa Clara county, California, in the Santa Cruz mountains, at an elevation of 1,700 feet above the sea.

These mines were first worked for quicksilver in 1845, but the operations were on a small scale, and no record exists earlier than 1850. They have been, and are now, the most productive quicksilver mines in the world, excepting only the mines of Almaden in Spain. They are developed to a depth of 1,300 feet, and the workings extend horizontally, somewhat in the shape of the letter Y.

Between 500 and 600 men find steady employment—the work being actively prosecuted throughout the year. From the 1st of January, 1864, to the 31st of December, 1875, the number of feet of drifting and sinking on the mines of the company, as shown by the records, amounted to 129,724 feet, or 26.24 miles, at a cost of \$1,000,000. This does not include the excavations made in extracting ore during the period named, nor any expense for the same.

In 1875 there were used in the mines 2,361 kegs of black powder (25 pounds each), and 9,350 pounds of giant and hercules powder—the rock in most cases requiring to be drilled and blasted. At the close of the same year, about five miles of railroad, underground, were in operation, and over 2,000 drills were in active use.

The reduction works consist of nine furnaces, and include the most improved methods for working quicksilver ores. When the present improvements are finished, they may be considered as most complete and perfect in every respect.

The total product of all the mines on the company's property up to December, 1875, was 606,453 flasks of quicksilver, of 76½ pounds each, or 46,393,654½ pounds. The average percentage of the ore of the New Almaden for 23 years and 3 months is 14.58. The highest percentage for any year was in 1850-51, when it averaged 36.74 per cent.; the lowest was in 1874, when it was 4.29 per cent. The mines are now in a prosperous condition.

Chinese Miners.

In several places in the interior trouble is brewing between white and Chinese miners, and more difficulty is apprehended. The most curious way of getting ahead of the Chinamen that we have heard of is that adopted recently. It is said that the miners at Sweetland and all along between that place and French Corral, are actively engaged in forming a Miner's League, the object of which is to compel men that employ Chinese labor to pay the same wages per diem as white men receive for the same kind of work. This is assuredly a queer way of treating the question, and at least poses the merit of novelty. The San Juan Times, (Nevada county) in speaking of this subject says: We interviewed Judge Bell, superintendent of the Milton mines, a few days ago, and asked, among other things, "why he did not employ white labor instead of Chinese labor." He answered that the mines at present could not afford him to work white labor. He said the expenses of his company were so heavy that he could hardly make both ends meet with cheap labor; that if white labor was employed the mines would run behind and would soon force him to stop work. He said also that he would employ all white boys who desire to work, and pay them Chinese wages until such times as they may be able to earn more. He thinks there are a host of white boys who are being brought up in idleness that would make good men if they had a chance, and he proposes to give them a chance in his mines. He told us that he was ready to receive all who might come. All he asks is, that they will work and earn something for themselves. If there are any boys in this place who feel like earning their own living, here is a chance for them to do so.

CALIFORNIA GIANT MILL.—We are informed that the Boston mining company, A. P. Bacon, president, and James Brady, superintendent, whose mine is located at Mokelumne Hill, have just purchased and shipped a Cowles California Giant, quartz mill, such as we have briefly described in a recent issue. An experimental mill made of wood of this kind was put on the Alabama mine, near Jamestown, which is now doing good work, though not more than one-half the size of the new improved iron mill. Another mill of the improved pattern has also just been sold to the Oliver mining company, at Grey Eagle in El Dorado county. These mills are something like the Chilean mills in principle, but altogether different in construction. We will give the results of the work done by this mill as soon as it gets in good working order.

THE Lake Democrat says it is reported that John Parrott will take \$100,000 stock in a railroad to Lower Lake.

The Mining Detritus Question.

This very important question, which has been pretty thoroughly discussed this winter since legislative attention has been called to it, will have to be settled by a Federal commission, which will probably consist of competent government engineers. We have published in full the resolutions, reports of committees and memorials on this subject since discussion on it first commenced, and this week give the result of the vote in the Assembly.

We gave in our issue of March 18th the Mining Committee's report on the question, with the memorial to Congress, and in our issue of March 11th gave the Agricultural Committee's report on the same subject. The Assembly voted on the question on Wednesday of this week and decided by a very close vote to adopt the report of the latter committee.

Berry, the author of the bill, made a long speech in its favor, and it was then agreed to deal with the concurrent resolutions on the subject before disposing of the bill. Considerable wrangling ensued on a motion by Carpenter to postpone the whole subject-matter until Thursday, and another by Keddick to postpone the bill and take up the resolutions now. The latter motion prevailed.

Carpenter then moved the adoption of the resolution of the Committee on Mines in place of that of the Committee on Agriculture and the series of resolutions introduced early in the session by Berry. Carpenter said he was not prepared to vote for any resolution which said in so many words that the rivers and bays of this State are being filled up by the detritus, tailings, slickens, or whatever it was called, that came from the hydraulic mines. He did not believe it necessary for the purpose of the resolution to make such a statement. He did not believe it was wholly true, and argued that the facts would compel him to vote for the resolution of the Committee on Mines in preference to that of the Committee on Agriculture.

In the speech which he made against the foregoing memorial, Speaker Carpenter quoted statistics to prove that the Sacramento river carries less earthy matter in suspension than the Mississippi, the Ganges, the Nile and the Po. The last mentioned river carries nearly seven times as much. These rivers are all navigable in spite of the vast amount of earthy material transported by them. He read from a statement furnished him as an answer to T. J. Arnold's article on San Francisco harbor. This statement contained the following opinion on the filling up of Suisun bay: "If the Sacramento at Sacramento, draining less than one-third the entire drainage area of Suisun bay, carries by weight one to 1,000 of earth to water, it is safe to say that the entire water coming into Suisun bay will not average more than one to 1,500 by weight, or by bulk one to 3,000, and which is certainly an outside estimate. The average rainfall of the 54,000 square miles which drain into Suisun bay is about two feet, of which not over one-fourth finds its way into the bay, being say one-half foot, or a body of water one foot deep over 27,000 square miles. Now, we will assume that each 3,000 feet contains one foot of solid earth; hence, dividing 27,000 by 3,000 we have one square mile filled each year nine feet. In addition to the earth suspended in the water, there is also a certain amount of material being carried along the bottom of the stream by the force of the current; for this we will add 10 per cent. (same proportion used by Arnold), and we have then as a result one square mile filled each year to a depth of 10 feet instead of 41 feet, as erroneously stated by Arnold. A large part of this deposit of sediment is placed upon the lands between high and low tides, a fact which Arnold neglects in his estimate. From foregoing estimates it is safe to say that it will be 100 years before Suisun bay is filled up, as Mr. Arnold predicts. Even then the Sacramento and San Joaquin rivers will continue to have a navigable channel through the low lands now in the course of formation, and their navigability will not in the least be injured. When Suisun bay is thus filled in a century from this, the State will have added to its productive area from 40,000 to 50,000 acres of land of a fertility not to be excelled anywhere. Hence this slow filling up of Suisun bay will end in the great ultimate advantage of the State. The Sacramento mill is reclaiming for us slowly what otherwise would cost us millions of dollars to reclaim by artificial means." Mr. Clunie asked whose figures these were and it transpired that they were the calculation of J. Hamilton Smith, Jr., a gentleman well known as one of the most accomplished hydraulic engineers in the State, and superintendent of the largest gravel mine in California.

After Mr. Carpenter's speech Clunie followed for the agriculturists, and after him Blackwell for the miners. The previous question was suspended, and the resolutions of the Agricultural Committee were adopted as a substitute for the original, by the following vote: Ayes—Abbott, Bagge, Barber, Berry, Briggs, Bradley, Burbank, Carter, Clarks, Coffey, Collins, Clunie, Dixon, Hart, Hayne, Henshaw, Jameson, Kennedy, Lambourne, Lammers, Orton, Patterson of Kern, Patterson of San Joaquin, Preston, Quigley, Rankin, Rice, Ruggles, Sargent, Saverkrup, Swan, and Watkins—32.

Noes—Birney, Blackwell, Blue, Brieland, Broderick, Chapman, Carnwell, Covington, Crutcher, Donlap, Garrettson, Giffen, Griswold, Harding, Jones, Koutz, McInerney, McCarthy, Murphy of Del Norte, Murphy of San Fran-

cisco. Nott, O'Connell, Pullen, Ruisch, Rsd dick, Roberts, Samuels, Wilcox, Young and Mr. Speaker—31. The substitute was then ordered to engrossment by a vote of 33 to 31.

The memorial ordered to engrossment sets forth—First, That the detritus discharged from the hydraulic mines located upon the headwaters of the Sacramento, Feather, Yuba and Bear rivers, all of which flow into the bay of San Francisco, is having the effect of filling up all of those streams with sand and mountain debris, thereby threatening the villages and towns located on them with inundation and destruction of life and property, as well as obstructing to a great extent the navigation of the Sacramento and Feather rivers. Second, That it has been estimated by T. J. Arnold, engineer of the State Board of Harbor Commissioners, that at the rate the debris is now being washed down, it will take but 15 years to fill Suisun bay, but 31 years to complete the destruction of San Pablo bay; after which the bay of San Francisco proper is the only receptacle left for this entire debris washed from the mines. Third, That agricultural lands in the Sacramento valley are being covered up with unproductive mining debris, and there has already been destroyed over 75,000 acres, valued at \$6,350,000, with improvements on them worth fully as much more. Fourth, That at Sacramento and Marysville levees have been constructed at great cost, but that unless decided steps are taken for the relief of these cities, it will be impossible longer to resist the encroachments of the water and debris. The memorial, therefore, asks for the appointment of a federal commission, consisting of civil engineers, to ascertain as accurately as may be, the amount of detritus annually discharged from hydraulic mines into the Sacramento, Feather, Yuba, Bear, American and other rivers, and into the bays of the State. Also to inquire into the feasibility and probable cost of diverting and controlling said detritus so as to deposit the same upon swamp and overflowed lands, or upon the foothill lands, or retain the same in the mountains, or to suggest any other plan as will prevent injury to the valley lands, rivers or bays of the State, for the purpose of laying the same before Congress at a subsequent session.

This action of the Assembly may look like a decided triumph for the agriculturists, and if it should so prove it will be the fault of the miners alone, who have taken so little active interest in the matter. They probably are confident that their position is an unassailable one, as having priority of right; and they know the mines will continue to be worked one way or another. The Congressional commission, however, will take little notice of what has been said, but will start in from the bedrock and thoroughly investigate the whole thing. It is well known that in the tule lands the owners would gladly pay for the privilege of allowing this muddy water to settle on their lands occasionally if it could be controlled. As the government has given rights and titles to both miners and farmers, it may turn out that the government will have to foot the bills if any new system should have to be inaugurated. The question now, however, will be in proper hands, as intelligent, educated and unbiased government engineers will investigate; and those having conflicting interests should prepare themselves to abide by their decision, whatever it is. One thing sure, matters will have to remain as they are for some time to come.

Academy of Sciences.

A regular meeting of the California Academy of Sciences was held on Wednesday evening last. Ches. F. Hastings was elected a resident member. A large number of mineral specimens were received as donations to the cabinet from different persons.

Mr. F. Gruber, of Woodward's gardens, Curator of Ornithology of the Academy, read the first of a series of lectures on the subject of ornithology. The lectures are illustrated by specimens prepared by Mr. Gruber himself, over 40 vultures, eagles, falcons, hawks and owls being exhibited at the first lecture. Mr. Gruber's lectures are semi-scientific in character, and are well worth hearing, being by no means dry.

W. N. Lockington read a paper describing 18 new species of California crustacea.

A memorandum prepared by Prof. Davidson, showing his calculation of the solar eclipse of March 25th, 1876, for the United States coast survey station, Washington square, San Francisco, was read, as follows: Mean time of beginning, March 25th, 1h. 07m. and 07 seconds, A. M. First contact, 117° 18' to the west of the North point. First contact, 86° 40' to the right of the sun's vortex. Mean time of ending, March 25th, 1h. 51m. 15s. P. M. Last contact, 30° 36' to east of North point. Last contact, 21° 00' to right of the sun's vortex. Duration of the eclipse, 2 hours, 44 minutes, and 8 seconds. Magnitude, 9.4 digits.

LATEST reports from the Yellowstone region shows that serious trouble is likely to result from the rush to the Black hills. The Sioux, Blackfeet and Apsinabones have had many pipe smoking lately, and rumors of conferences of the Sioux with the other tribes are of daily occurrence.

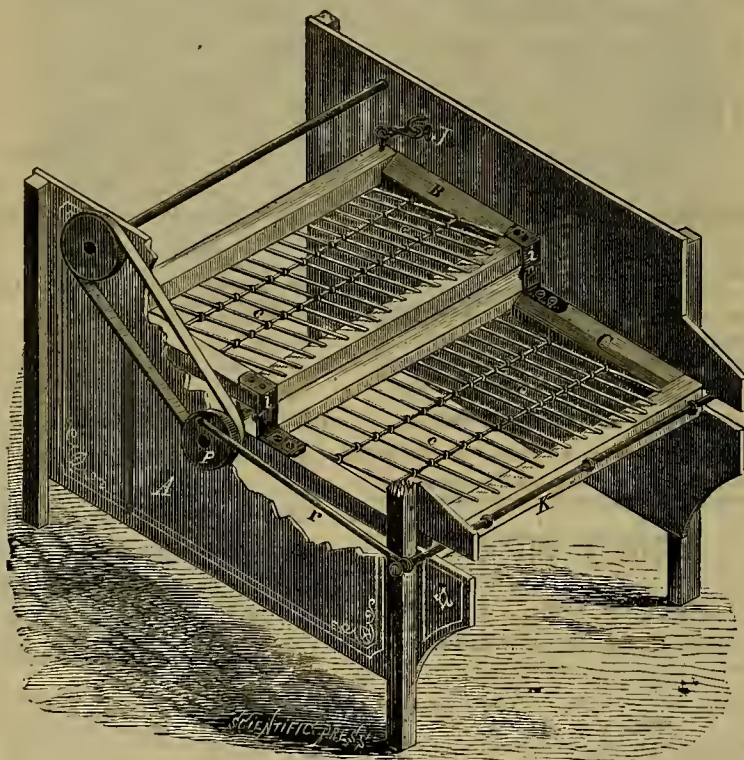
Two men were buried up in a tunnel of the Menzantine mine, near Virginia City, on Friday last, by a cave, and remained there 12 hours before they could be dug out.

Brown's Undulating End-Shake Shoe.

A Laid and Important Improvement in Grain Separators.

We illustrate on this page a very valuable improvement for grain separators, invented by N. M. Brown, of Pescadero, Cal. It has been in use about two years, and has proven superior to the ordinary end-shake shoe, because the invention combines an undulating motion with the end-shake, thus making the operation of cleaning more positive. It always keeps itself clean, is simple and easily put in any thrasher, and will not get out of order readily. It presents more cleaning surface than any other shoe in use; requires less time to set the machine, one stake (at the end of the tongue) being all that is necessary; runs smoother, lighter, and with less power than the side-shake; but most important of all, it will save and clean all the grain that any cylinder can thresh.

The riddle is constructed in two or more sections. Each section consists of a wooden frame which is of proper width to fit easily inside the separator frame. Across these frames are stretched parallel wires at a proper distance apart to form meshes or spaces between them of desired size. These sections are then connected together by means of hinges or other suitable loose jointed connections, so that the end of one screw will be below the other, being



BROWN'S UNDULATING END-SHAKE SHOE.

careful to have the ends of the sections at which the wires are secured to the bottom of the bottom side of the frame, standing in the same direction. These connected sections are then secured inside of the separator frame by suspending the extremity of one end section by means of link hangers from the side of the frame, while the extremity of the opposite section is supported by a rod, the ends of which pass through a slot in the sides of the frame. A shaft passes across the frame directly below the hinged end of the uppermost section, so as to support it, leaving the end of the lower section to hang by the connecting hinges. The shaft has one or more arms, which serve as lifters or cams for raising and lowering the hinged end of the sections or middle of the riddle. A crank wheel is secured to each end of the shaft, and a rod connects these cranks with the projecting ends of the rods, which supports the rear end of the riddle. Thus it will be seen that by turning the shaft, the riddle will be moved back and forth longitudinally, and at the same time its hinged middle portion will be moved up and down, so as to give the riddle an undulating motion. By hinging the end of one section below the end of the adjoining section, is provided a drop for the straw and grain, which loosens up the straw and allows the grain to pass through the riddle.

The farmers in California have had considerable experience with both end-shake and side-shake grain separators; but we believe that when properly regulated and adjusted the end-shake shoe has proven itself superior to all others. The ordinary end-shake shoe, first introduced, was uncertain and unsatisfactory in its action, and could not be relied upon. The Brown shoe is entirely independent of that nice adjustment so requisite to the ordinary end-shake. It combines two motions, one an undulating and the other an end-shake, and these motions render it so complete in its action that it never clogs and does its work perfectly. A good separator is a necessity where the farmer has any care about the quality of the grain he puts upon the market. We call the

attention of farmers and manufacturers to this shoe, believing that it possesses substantial merit. Mr. H. C. Brown, the proprietor of the patent, can be consulted or addressed at the office of Geo. Morrow & Co., 39 Clay street, San Francisco.

Gems and Precious Stones.

(Written for the Press by HENRY G. HANES.)

(Continued from last week.)

(11.) Phosphorescence. A mineral is said to be phosphorescent when it has the property of emitting light; some minerals become phosphorescent when rubbed together in the dark; some by scratching harder substances than themselves; others by percussion; others again by heat. Lime shows this property on being strongly heated before the blowpipe, the intensity of the light being greater than that of the blowpipe flame. This property of lime is taken advantage of in the drummond light.

To show phosphorescence by heat a piece of red iron should be taken into a dark room and the powdered mineral thrown upon it as soon as the temperature of the iron falls below visible redness.

Touch. Some minerals have a peculiar feeling when rubbed with the ends of the fingers. Soapstone or stasite for instance, feel greasy or unctuous; the powder of other minerals feels dry, rough or spongy. Certain gems and crystals are cold when touched by the tongue, others

Table of Precious Stones—Arranged According to Color.

NAME.	HARD-NESS.	SP. GRAV.
Limpid or Colorless Stones.		
A Diamond.....	10	3.529
K Rock Crystal, (Brazilian Pebble).....	7	2.64
B Sapphire.....	9	3.951
F Topaz.....	8	3.54
G Zircon.....	7.5	4.73
Yellow Stones.		
E Beryl.....	7.5	2.67
C Gypsum, (Chrysoberyl).....	2	3.754
A Diamond.....	10	3.529
E Emerald.....	7.5	2.68
M Opal.....	6	2.00
B Oriental Topaz.....	9	3.951
K Quartz, (False Topaz).....	7	2.64
K Quartz, (Jasper).....	7	2.64
F Topaz.....	8	3.54
G Zircon.....	7.5	4.76
Red Stones.		
D Balas Ruby.....	8	3.52
F Brazilian Topaz.....	8	3.54
K Carnelian.....	7	2.66
A Diamond.....	10	3.529
K Heliotrope.....	6.5	3.631
G Hyacinth.....	7	4.01
H Pyrope.....	6.5	3.78
K Quartz, (Rose Quartz).....	7	2.64
K Quartz, (Jasper).....	7	2.64
B Ruby.....	9	3.951
I Rhodolite.....	7	2.99
Green Stones.		
E Aquamarine, (Beryl).....	7.5	2.68
P Amazon Stone.....	6	2.45
L Chrysolite, (Pseudot).....	7	3.44
C Chrysoberyl.....	8.5	3.76
K Chrysoprase.....	7	2.65
A Diamond.....	10	3.529
E Emerald.....	7.5	2.68
K Heliotrope, (Blood Stone).....	7	2.42
P Haüyne.....	6.5	3.35
C Idocrase.....	6.5	3.49
N Malachite.....	3.5	3.7
B Oriental Emerald.....	9	3.951
K Quartz, Prase.....	7	2.64
Quartz, Jasper.....	7	2.64
D Spinell.....	8	3.62
I Tourmaline.....	7	2.99
G Zircon.....	7.5	4.76
Blue Stones.		
A Diamond.....	10	3.529
B Sapphire.....	9	3.951
E Aquamarine.....	7.5	2.678
B Cyanite.....	6-7	3.661
D Spinel.....	8	3.523
F Brazilian Topaz.....	8	3.541
I Indicolite.....	7	3.076
S Turquoise.....	6-7	2.698
J Dichroite.....	7.5	2.596
P Haüyne.....	6.5	2.425
Q Lazulite.....	5.5	3.122
P Lapis Lazuli.....	5.5	2.38
Violet Stones.		
A Diamond.....	10	3.529
B Oriental Amethyst.....	9	3.951
K Amethyst.....	7	2.65
I Tourmaline.....	7	3.076
Axinite.....	7	3.271
Amandine Ruby.....	8.5	3.16
D Spinel.....	8	3.523
H Garnet.....	8.5	3.78
Stones Showing Play of Colors.		
B Asteria Star Sapphire.....	9	3.931
C Chrysoberyl.....	8.5	3.754
H Garnet.....	6.5	3.631
M Hydrophane.....	6	2.00
M Precious Opal.....	6	2.00
P Labradorite.....	6	2.621
J Dichroite, (Iolite).....	7.5	2.596
K Cat's Eye.....	7	2.657
P Adularia.....	6	2.581
K Aventurine.....	7	2.64
P Moon Stone.....	5	2.762
Brown Stones.		
A Diamond.....	10	3.529
G Zircon, (Hyacinth).....	6.5	4.681
H Garnet.....	6.5	3.631
H Eschont.....	6.5	3.631
I Tourmaline.....	7	2.99
K Carnegom.....	7	2.64
K Jasper.....	7	2.64
Axinite.....	7	3.271
Black Stones.		
A Diamond.....	10	3.529
K Rock Crystal.....	7	2.64
I Tourmaline.....	7	2.99
P Obsidian.....	5.5	2.363
A Jet.....	2.5	1.166
A Cannel Coal.....	2.5	1.166
D Pionast.....	8	3.523
K Jasper.....	7	2.64

(To be Continued.)

General News Items.

COUNTERFEIT trade dollars are in circulation.

The training ship *Jamestown* will be ready to receive students in about a week.

KEYSEN, one of the Tweed ring in New York, has been taken to the lunatic asylum.

ENGLISH mechanics are moving in ways to be handsomely represented at the Centennial.

The President has nominated John M. Coghlan, of California, as Chief Justice of Utah.

GEN. SCHENCK declines to be interviewed in connection with the Emma mine, but intimates that he will vindicate his own conduct.

STEPS are being taken by the Board of Supervisors of this city, to call a public meeting and send a deputation to Congress on the Chinese immigration question.

PIPER, by authority of the Committee on Commerce, has reported for passage his bill to relinquish the Marine hospital property in San Francisco for use as a Sailors' Home.

THE announcement of the decision of the Supreme Court of the United States declaring the laws of California in regard to Chinese emigration null and void has produced a profound sensation in this community.

ROSENSTEIN, sentenced to be hanged for the murder of Sara Alexander, has been granted a stay of execution by Judge Brady, until the case is reviewed by the general term of the Supreme Court.

THE Senate Committee on Privilege and Elections, on the 17th inst., beg an investigation of the charge against Senator Spencer of Alabama, that he secured his election by corrupt means.

The Government and the Black Hills.

A bill has been reported from the Senate Committee on Indian Affairs for an agreement with the Sioux nation, etc. It is, with a few amendments, the measure introduced by Mr. Allison. It provides for the appointment by the President of five commissioners, of whom one shall be an army officer not of lower rank than a brigadier general; another shall be learned in the law, and another shall speak the Sioux language; whose duty will be to visit the various tribes of Sioux and endeavor to make an agreement with them for the absolute relinquishment of their title to the Black hills country in return for an agreement on the part of the Government to provide for their subsistence and support for a period not exceeding 10 years. The appropriations for the purpose are to be in addition to the sums stipulated for by the treaty of 1868. The bill also provides that all appropriations hereafter made for the subsistence of the Sioux nation shall be upon the condition that they will agree to relinquish the Black hills and cede the right of the United States to secure free access to them by wagon roads, etc. Also, that they will receive all their supplies from points near the Missouri river, as the Government may provide, and they will acquiesce in such methods as may be provided by law, or adopted by the President, to advance them in civilization and means of self-support.

THE WHITE PINE TUNNEL.—It seems, after all, says the *Eureka Sentinel*, that an attempt will be made to tunnel Treasure bill, in White Pine county. Some months ago we published an item setting forth that Major Henry had organized a company in the East for this purpose. A Burleigh drill and other machinery consigned to Major Henry at White Pine has just been received at the depot of the Eureka and Palisade railroad in Eureka. This would seem to indicate that active operations are to be inaugurated. The magnitude of the enterprise is not much less than that undertaken by Sutro, and the belief is justified that its successful completion will be of far greater benefit to the mining world. The opinion has always prevailed among mining men that untold mineral wealth lies locked deep down in the bowels of Treasure mountain. The projected tunnel is designed to pierce the mountain at a great depth in one of the most favorable localities. We wish Major Henry success, and hope he has a stiff company to back him in his stupendous undertaking.

ANDREW McPHERSON, superintendent of the Newark mill, in Condon canon, while returning home from Bullionville on Tuesday night met with an accident, resulting, it is supposed, in instant death. As near as can be ascertained, when a short distance from Bullionville, McPhereson attempted to make his horse jump a culvert that runs under the railroad at that point. The horse made the jump, a distance of about 14 feet, but fell on the landing, throwing McPhereson head-foremost to the frozen ground, breaking his skull. Deceased was about 38 years of age, and a native of Ohio.

PNEUMONIA is alarmingly epidemic in the vicinity of Fairplay, Colorado, and the miners are leaving by dozens, while some of the mines are entirely deserted.

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Sulphurets: What They Are, How Concentrated, How Assayed, and How Worked, with a Chapter on the Blow-Pipe Assay of Minerals. By Wm. M. Barstow, M. D.; 1867; cloth bound, 114 pages. Printed and sold by Dewey & Co. Price, \$1; postage free. The best written work, and most complete work on the subject treated.

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Office of the Marshal for the District of California, San Francisco, March 4th, 1876. To Messrs. A. T. Dewey & Co., of San Francisco and State of California, creditor of J. T. LITTLE, bankrupt:

You are hereby notified that a warrant in bankruptcy has been issued out of the District Court of the United States for the District of California against the estate of J. T. LITTLE of the city and county of San Francisco, adjudged bankrupt upon his own petition. That the payment of any debts and the delivery of any property belonging to said bankrupt, to him or for his use, and the transfer of any property by him, is forbidden by law. That a meeting of the creditors of said bankrupt, to wit: Henry Gassett & Co., or Gassett, Bullard & Co., Boston, Mass., \$—; Seth Bryan, Boston, \$—; Danforth & Son, Boston, \$—; Chas. Fitz, Orléans, Maine, \$—; Boller, Coloma, Calif., \$—; W. E. Lewis, unknown, \$33; Adams, Shinn & Co., S. F., \$147; H. P. McNevin, S. F., \$750; H. D. Bacon, S. F., \$83; F. W. Vale, S. F., \$200; J. D. P. Theller, S. F., \$—; A. J. Coshill, S. F., \$—; A. A. Snyder, S. F., \$233; Peter Dean, S. F., \$403; Little & Kaeding, S. F., \$120; Lusk & Co., S. F., \$70; Kohler, Chase & Co., S. F., \$250; Geo. Lander, S. F., \$400; G. O. McMullen, S. F., \$163; Miller & Hall, S. F., \$60; A. L. Bancroft & Co., S. F., \$100; A. T. Dewey & Co., S. F., \$83; Richard Ivers, S. F., \$500; A. T. Stevenson, S. F., \$70; John Malloy, S. F., \$112; W. G. Aiton, S. F., \$229; H. M. Bennett, S. F., \$310.57; Clark A. Sears, S. F., \$4,000; E. Schmidt, S. F., \$41.40; C. F. Cresswell, S. F., \$6; E. Post, S. F., \$1,177. Being the creditors upon the schedule filed with said bankrupt's petition, to prove his debts and choose one or more assignees of said estate, will be held at a court of bankruptcy, to be held on the 15th day of March, A. D. 1876, at 10:30 o'clock, A. M., at room No. 10, Court block, 635 Clay street, S. F., before J. M. GILBELL, Register. EDWIN P. MARSELLUS, U. S. Marshal as Messenger, District of California.

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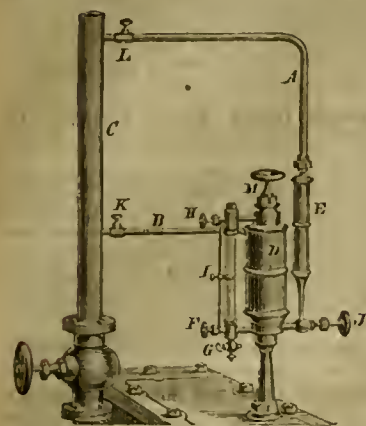
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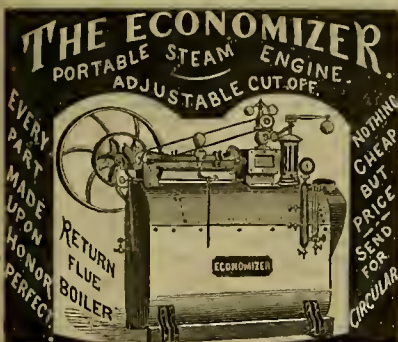
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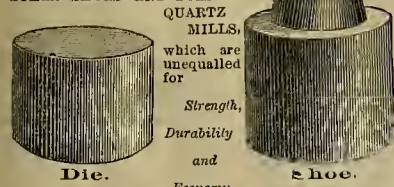
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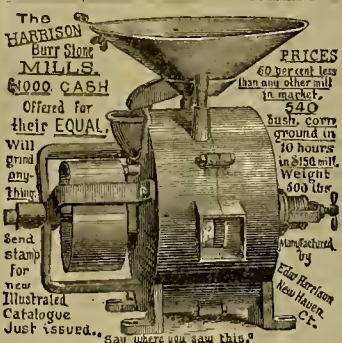
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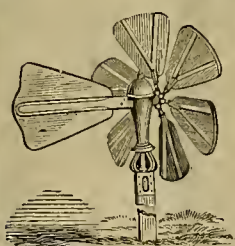


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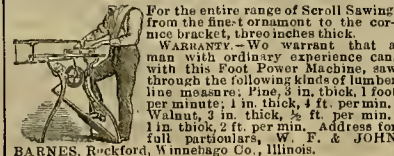
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FROM OFFICIAL REPORTS FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.]

By Special Dispatch, Dated Washington D. C., Mar. 21st, 1876.

FOR WEEK ENDING MARCH 7TH, 1876.*

CLEANSING COMPOUNDS.—Margaret N. Cross, S. F., Cal.

MACHINE FOR STONING FRUIT.—Benjamin A. Lillie, Portland, Ogn.

BLAST FURNACE.—John H. Rawlings and Lambert Irelan, Watsonville, Cal.

REMEDIES FOR DISEASES OF THROAT AND LUNGS.—Ellen Rohrer, Monmouth, Ogn.

TWIN STAIRS, ELEVATORS AND LIGHT SHAFTS.—Samuel Gray, S. F., Cal.

TRADEMARK.

SOAP.—Rock Sosp Company, S. F., Cal.

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[WHOLESALE.]

WEDNESDAY M., March 23, 1876

American Pig Iron, 30 ton	33 00	@	36 00
Scotch Pig Iron, 30 ton	33 00	@	37 00
White Pig, 30 ton	33 00	@	38 00
Oregon Pig, 30 ton	33 00	@	40 00
Refined Bar, best assortment, 30 lb	34 00	@	34 00
Refined Bar, good assortment, 30 lb	34 00	@	34 00
Boiler, No. 1 to 4	34 00	@	34 00
Plate, No. 5 to 9	34 00	@	34 00
Sheet, No. 10 to 14	34 00	@	34 00
Sheet, No. 15 to 20	34 00	@	34 00
Sheet, No. 20 to 24	34 00	@	34 00
Sheet, No. 24 to 28	34 00	@	34 00
Horse Shoes, per doz	34 00	@	8 00
Nail Rod	34 00	@	10 00
Norway Iron	34 00	@	10 00
Roller Iron	34 00	@	10 00
Other Irons for Blacksmiths, Miners, etc.	34 00	@	4 00
COPPER.			
Braziers	35 00	@	35 00
Copper Tins	35 00	@	35 00
Copper Plates	35 00	@	35 00
Sheathing, 30 lb	35 00	@	35 00
Sheathing, Yellow	35 00	@	35 00
Sheathing, Old Yellow	35 00	@	35 00
Composition Nails	35 00	@	35 00
Composition Bolts	35 00	@	35 00
STEEL.—English Cast, 30 lb	35 00	@	35 00
Anderson & Wood's American Cast	35 00	@	35 00
Drill	35 00	@	35 00
Flat Bar	35 00	@	35 00
Flow Steel	35 00	@	35 00
IRON PLATES.			
10x12 I C Charcoal	10 50	@	11 00
10x14 I X Charcoal	12 50	@	13 00
Roofing Plate I C Charcoal	10 00	@	10 50
Bamoa Tin	18 00	@	18 00
Australian	18 00	@	18 00
ZINC.—By the Cask.			
Zinc Sheet 13x15, No 7 to 10	11 00	@	11 00
do do 13x15, No 11 to 14	11 00	@	11 00
do do 8x15, No 8 to 10	11 00	@	11 00
do do 8x15, No 11 to 14	11 00	@	11 00
NAILS Assorted sizes.	3 00	@	3 75
SILVER.			
WICKSILVER, per lb	72 1/2	@	75 1/2

LEATHER.

[WHOLESALE.]

WEDNESDAY M., March 23, 1876.

City Tanned Leather, 30 lb	22 00	@	22 00
Santa Cruz Leather, 30 lb	22 00	@	22 00
Country Leather, 30 lb	22 00	@	22 00
Stockton Leather, 30 lb	22 00	@	22 00
Jodot, 11 to 13 Kil, per doz	50 00	@	50 00
Jodot, 14 to 16 Kil, per doz	50 00	@	50 00
Jodot, second choice, 11 to 13 Kil, per doz	50 00	@	50 00
Corneillean, 12 to 15 Kil	50 00	@	50 00
Corneillean Females, 12 to 15 Kil	50 00	@	50 00
Corneillean Females, 14 to 15 Kil	50 00	@	50 00
Simon Ulmo Females, 12 to 15 Kil	50 00	@	50 00
Simon Ulmo Females, 14 to 15 Kil	50 00	@	50 00
Simon, 18 Kil, per doz	50 00	@	50 00
Simon, 20 Kil, per doz	50 00	@	50 00
Simon, 22 Kil, per doz	50 00	@	50 00
Robert, 24 Kil, per doz	50 00	@	50 00
French Kip, 30 lb	40 00	@	40 00
California Kip, 30 lb	40 00	@	40 00
French Sheep, all colors, 30 lb	8 00	@	15 00
Eastern Calf for Backs, 30 lb	1 00	@	1 00
Sheep Roams for Topping, all colors, 30 lb	4 00	@	4 00
Sheep Roams for Linings, 30 lb	5 00	@	5 00
Sheep Roams for Linings, 30 lb	5 00	@	5 00
Good French Calf Root Legs, 30 lb	4 00	@	4 00
French Calf Root Legs, 30 lb	4 00	@	4 00
Harness Leather, 30 lb	24 00	@	24 00
Fair Bridle Leather, 30 lb	40 00	@	40 00
Skirting Leather, 30 lb	30 00	@	30 00
Welt Leather, 30 lb	30 00	@	30 00
Suit Leather, 30 lb	17 00	@	17 00
Wax Side Leather, 30 lb	17 00	@	17 00

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by CHARLES BURTON & Co.]

SAN FRANCISCO, March 23, P. M.

LEGAL TENDERS IN S. F., 11 A. M., 83 to 88 1/2.

GOLD IN N. Y. 114.

GOLD BARS, 900. SILVER BARS, 11 and 15 percent discount.

EXCHANGE ON N. Y., 60-100 per cent premium for gold; on London banks, 40-50 commercial, 48 1/2; Paris, five francs per dollar; Mexico, dollars, eight to ten per cent discount.

LONDON — Consols, 93 to 93 1/2; Bonds, 102 1/2.

QUOTATIONS IN S. F., by the Bank, per lb. 72 1/2 to 75.

To Mining Companies.

A Mining and Civil Engineer of long experience, well acquainted with the superintendence of mines and mills, the projecting and construction of hydraulic works, machinery, etc., is open for re-engagement. Apply to Messrs. Dewey & Co., of the MINING & SCIENTIFIC PRESS, 224 Sansome street, San Francisco, for reference, or to J. B., Postoffice Box 633, Oakland, Cal.

BOUND VOLUMES OF THE MINING AND SCIENTIFIC PRESS from Jan. 1st, 1864, are for sale at this office at \$4 per volume, two volumes a year. Unbound at \$3 per volume.

STOCKHOLDERS' MEETING.

Eureka Stone Manufacturing Company—A Stockholders' Meeting of the above-named company for the election of Directors for the ensuing year, and for the transaction of such other business as may come before the meeting, will be held at the company's office, No. 207 Sansome street, San Francisco, on Tuesday, the eleventh day of April, 1876, at 11 o'clock, A. M. WILLIAM HOOD, President. P. D. MOWELL, Secretary.

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

California Acclimatizing Society—Location of principal place of business, San Francisco, Cal.

NOTICE.—There are delinquent upon the following described stock, on account of assessment (No. 6), levied on this ninth day of February, 1876, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificates.	No. Shares.	Amount.
Anthony, T. E.	17	1	\$ 50
Anthony, T. E.	250	9	4 50
Bach, John	14	1	50
Bach, John	225	24	12 00
Bonny, O. W.	24	1	24
Bonny, O. W.	208	24	12 00
Bigelow, J. E.	612	5	2 50
Belemere, A.	112	1	50
Belemere, A.	261	24	12 00
Budd, W. C.	985	5	2 50
Budd, W. C.	986	5	2 50
Bramman, J. J.	192	5	2 50
Bramman, J. J.	380	24	12 00
Bosqui, E.	617	10	5 00
Butler, F. S.	623	10	5 00
Boswell, S. B.	669	25	12 50
Britton, Jos.	784	10	5 00
Bryan, J. M.	896	4	2 50
Barrow, P.	992	10	5 00
Brewer, Wm.	796	1	50
Badlam, Alex.	20	1	50
Burgess, O. O.	54	1	50
Burton, T. O.	129	1	50
Clark, S. B.	171	1	50
Clark, S. B.	172	1	50
Clark, S. B.	926	5	2 50
Clark, S. B.	927	5	2 50
Clark, S. B.	928	5	2 50
Clark, S. B.	929	5	2 50
Clark, S. B.	930	5	2 50
Clark, S. B.	931	5	2 50
Clark, S. B.	932	5	2 50
Clark, S. B.	933	5	2 50
Clark, S. B.	934	5	2 50
Clark, S. B.	935	5	2 50
Clark, S. B.	936	5	2 50
Clark, S. B.	937	5	2 50
Clark, S. B.	938	5	2 50
Clark, S. B.	940	5	2 50
Clark, S. B.	941	5	2 50
Clark, S. B.	942	5	2 50
Clark, S. B.	943	5	2 50
Clark, S. B.	949	8	4 00
Co-ville, E.	192	1	50
Corville, E.	255	24	12 00
Corville, E.	286	24	12 00
Coffee, J.	625	10	5 00
Cluness, W. R.	651	5	2 50
Cbeney, R.	703	25	12 50
Clark, Mary	728	5	2 50
Cunningham, Z. H.	788	5	2 50
Collyer, T. H.	834	5	2 50
Chagneau, Victor A.	749	1	50
Cockrell, L. G.	871	1	50
Crofts, M. L.	374	1	50
Droer, R. A.	425	25	12 50
Dulsenberg, Chas.	688	10	5 00
Dean, Peter.	854	5	2 50
Donnelly, L. E.	944	5	2 50
Douglase, W. G.	748	1	50
Earl, John	715	25	12 50
Edwards, C. B.	718	5	2 50
Edelin, L. H.	977	5	2 50
Frontisr, P.	113	1	50
Frontisr, P.	262	24	12 00
Foot, L. H.	482	5	2 50
Forbes, A. B.	503	20	10 00
Fitzpatrick, John	668	5	2 50
Foard, J. W.	768	25	12 50
Gibbons, A.	173	5	2 50
Gibbons, A.	223	24	12 00
Gihhoos, A.	616	2	1 00
Gihhons, A.	964	5	2 50
Glascok, W. H.	182	1	50
Glascok, W. H.	395	24	12 00
Gamboni, Frederick	799	5	2 50
Gordon, H.	857	5	2 50
Grimes, G. T.	825	5	2 50
Glover, A.	790	1	50
Hickox, M. A.	193	1	50
Hickox, M. A.	246	10	5 00
Hickox, M. A.	247	10	5 00
Hickox, M. A.	248	4	2 00
Hammond, W.	718	25	12 50
Hooper, E. J.	735	1	50
Harris, S. R.	711	1	50
Hynes, A. B.	714	3	1 50
Jordan, D.	111	1	50
Jordan, D.	145	1	50
Jordan, D.	324	28	14 00
Jones, S. L.	889	10	5 00
Joice, E. V.	227	1	50
Joice, E. V.	227	24	12 00
Jossel, J. L.	708	25	12 50
Jackson, D. B.	868	5	2 50
Jordan, G. L.	373	1	50
Jordan, M. O.	794	1	50
Jordan, M. C.	795	1	50
Kimball, G. P.	84	1	50
Kimball, G. P.	318	24	12 00
Koster, A.	104	1	50
Koster, A.	343	22	11 00
Koster, A.	444	2	1 00
King, J. F.	57	1	50
King, J. F.	245	24	12 00
Kerr, S. R.	801	3	1 50
Larkins & Sposito	1018	250	125 00
Lohse, J. F.	179	1	50
Lohse, J. F.	196	24	12 00
Lohse, J. F.	622	15	7 50
Lohse, J. F.	618	17	8 50
Lse, S. W.	974	5	2 50
Laycock, E. H.	1041	5	2 50
Laycock, E. H.	1049	5	2 50
Laycock, E. H.	1055	5	2 50
Laycock, E. H.	1079	25	12 50
Laycock, E. H.	1080	12	6 00
Laycock, E. H.	1081	25	12 50
Laycock, E. H.	1082	25	12 50
Laycock, E. H.	1083	25	12 50
Laycock, E. H.	1084	25	12 50
Laycock, E. H.	1085	25	12 50
Laycock, E. H.	1086	23	11 50
Laycock, E. H.	1087	30	15 00
Laycock, E. H.	1088	25	12 50
Laycock, E. H.	1089	25	12 50
Laycock, E. H.	1090	25	12 50
Laycock, E. H.	1091	25	12 50
Laycock, E. H.	1092	25	12 50
Laycock, E. H.	1093	25	12 50
Laycock, E. H.	1094	25	12 50
Laycock, E. H.	1095	26	13 00
Merrill, O. R.	387	1	50
Merrill, O. R.	552	27	13 50
Mason, Chas.	413	25	12 50
McGovern, P.	21	1	50
McGovern, P.	230	24	12 00
McGovern, P.	834	2	1 00
Mason, J. H.	380	1	50
Mason, J. H.	380	24	12 00
McLard, A.	78	1	50

No. Certificate. No. Shares. Amount.			No. Certificate. No. Shares. Amount.			No. Certificate. No. Shares. Amount.			No. Certificate. No. Shares. Amount.		
Rathborne, R Wm.	136	100	Rathborne, R Wm.	330	100	Crawford, Geo L.	unissued	100	Rathborne, R Wm.	172	100
Rathborne, R Wm.	137	100	Rathborne, R Wm.	331	100	Cummins, Wm L.	unissued	105	Rathborne, R Wm.	173	100
Rathborne, R Wm.	138	100	Rathborne, R Wm.	332	100	Cummins, Wm L.	unissued	214	Rathborne, R Wm.	174	100
Rathborne, R Wm.	139	100	Rathborne, R Wm.	333	100	Cummet, W H.	125	100	Rathborne, R Wm.	175	100
Rathborne, R Wm.	140	100	Rathborne, R Wm.	334	100	Cummet, W H.	133	100	Rathborne, R Wm.	176	100
Rathborne, R Wm.	141	100	Rathborne, R Wm.	335	100	Cummet, W H.	434	35	Rathborne, R Wm.	177	100
Rathborne, R Wm.	142	100	Rathborne, R Wm.	336	100	Collins, C A.	105	100	Rathborne, R Wm.	178	100
Rathborne, R Wm.	143	100	Rathborne, R Wm.	337	100	Collins, C A.	106	100	Rathborne, R Wm.	179	100
Rathborne, R Wm.	144	100	Rathborne, R Wm.	338	100	Collins, C A.	111	100	Rathborne, R Wm.	180	100
Rathborne, R Wm.	145	100	Rathborne, R Wm.	339	100	Collins, C A.	113	100	Rathborne, R Wm.	181	100
Rathborne, R Wm.	146	100	Rathborne, R Wm.	340	100	Collins, C A.	114	100	Rathborne, R Wm.	182	100
Rathborne, R Wm.	147	100	Rathborne, R Wm.	341	100	Collins, C A.	117	100	Rathborne, R Wm.	183	100
Rathborne, R Wm.	148	100	Rathborne, R Wm.	342	100	Collins, C A.	118	100	Rathborne, R Wm.	184	100
Rathborne, R Wm.	149	100	Rathborne, R Wm.	343	100	Collins, C A.	119	100	Rathborne, R Wm.	185	100
Rathborne, R Wm.	150	100	Rathborne, R Wm.	344	100	Collins, C A.	120	100	Rathborne, R Wm.	186	100
Rathborne, R Wm.	151	100	Rathborne, R Wm.	345	100	Collins, C A.	121	100	Rathborne, R Wm.	187	100
Rathborne, R Wm.	152	100	Rathborne, R Wm.	346	100	Collins, C A.	122	100	Rathborne, R Wm.	188	100
Rathborne, R Wm.	153	100	Rathborne, R Wm.	347	100	Collins, C A.	123	100	Rathborne, R Wm.	189	100
Rathborne, R Wm.	154	100	Rathborne, R Wm.	348	100	Collins, C A.	124	100	Rathborne, R Wm.	190	100
Rathborne, R Wm.	155	100	Rathborne, R Wm.	349	100	Collins, C A.	125	100	Rathborne, R Wm.	191	100
Rathborne, R Wm.	156	100	Rathborne, R Wm.	350	100	Coster, F B.	435	76	Rathborne, R Wm.	192	100
Rathborne, R Wm.	157	100	Rathborne, R Wm.	351	100	Dimock, J De W.	unissued	250	Rathborne, R Wm.	193	100
Rathborne, R Wm.	158	100	Rathborne, R Wm.	352	100	Denslow, E H.	unissued	400	Rathborne, R Wm.	194	100
Rathborne, R Wm.	159	100	Rathborne, R Wm.	353	100	Denslow, E H.	267	100	Rathborne, R Wm.	195	100
Rathborne, R Wm.	160	100	Rathborne, R Wm.	354	100	Durand, John.	unissued	67	Rathborne, R Wm.	196	100
Rathborne, R Wm.	161	100	Rathborne, R Wm.	355	100	DeGree, J O.	unissued	100	Rathborne, R Wm.	197	100
Rathborne, R Wm.	162	100	Rathborne, R Wm.	356	100	Delano, Edward.	61	100	Rathborne, R Wm.	198	100
Rathborne, R Wm.	163	100	Rathborne, R Wm.	357	100	Delano, Edward.	52	100	Rathborne, R Wm.	199	100
Rathborne, R Wm.	164	100	Rathborne, R Wm.	358	100	Delano, Edward.	63	100	Rathborne, R Wm.	200	100
Rathborne, R Wm.	165	100	Rathborne, R Wm.	359	100	Eigenbrodt, Wm E.	unissued	15	Rathborne, R Wm.	201	100
Rathborne, R Wm.	166	100	Rathborne, R Wm.	360	100	Eaton, Elizabeth D.	unissued	15	Rathborne, R Wm.	202	100
Rathborne, R Wm.	167	100	Rathborne, R Wm.	361	100	Eigenbrodt, Sallie.	unissued	17	Rathborne, R Wm.	203	100
Rathborne, R Wm.	168	100	Rathborne, R Wm.	362	100	Eigenbrodt, David L.	unissued	32	Rathborne, R Wm.	204	100
Rathborne, R Wm.	169	100	Rathborne, R Wm.	363	100	Ford, Augustus.	unissued	270	Rathborne, R Wm.	205	100
Rathborne, R Wm.	170	100	Rathborne, R Wm.	364	100	Foster, C M.	unissued	200	Rathborne, R Wm.	206	100
Rathborne, R Wm.	171	100	Rathborne, R Wm.	365	100	Flaender, W H.	unissued	100	Rathborne, R Wm.	207	100
Rathborne, R Wm.	172	100	Rathborne, R Wm.	366	100	Francis, H M, Attorney.	25	100	Rathborne, R Wm.	208	100
Rathborne, R Wm.	173	100	Rathborne, R Wm.	367	100	Francis, H M, Attorney.	26	100	Rathborne, R Wm.	209	100
Rathborne, R Wm.	174	100	Rathborne, R Wm.	368	100	Francis, H M, Attorney.	27	100	Rathborne, R Wm.	210	100
Rathborne, R Wm.	175	100	Rathborne, R Wm.	369	100	Francis, H M, Attorney.	28	100	Rathborne, R Wm.	211	100
Rathborne, R Wm.	176	100	Rathborne, R Wm.	370	100	Francis, H M, Attorney.	29	100	Rathborne, R Wm.	212	100
Rathborne, R Wm.	177	100	Rathborne, R Wm.	371	100	Gardner, J O.	unissued	60	Rathborne, R Wm.	213	100
Rathborne, R Wm.	178	100	Rathborne, R Wm.	372	100	Gardner, J O.	unissued	600	Rathborne, R Wm.	214	100
Rathborne, R Wm.	179	100	Rathborne, R Wm.	373	100	Gilston & Basing.	unissued	303	Rathborne, R Wm.	215	100
Rathborne, R Wm.	180	100	Rathborne, R Wm.	374	100	Greenleaf, Norris & Co.	430	10	Rathborne, R Wm.	216	100
Rathborne, R Wm.	181	100	Rathborne, R Wm.	375	100	Greenleaf, Norris & Co.	431	35	Rathborne, R Wm.	217	100
Rathborne, R Wm.	182	100	Rathborne, R Wm.	376	100	Greenleaf, Norris & Co.	432	35	Rathborne, R Wm.	218	100
Rathborne, R Wm.	183	100	Rathborne, R Wm.	377	100	Greenleaf, Norris & Co.	433	35	Rathborne, R Wm.	219	100
Rathborne, R Wm.	184	100	Rathborne, R Wm.	378	100	Greenleaf, Norris & Co.	434	35	Rathborne, R Wm.	220	100
Rathborne, R Wm.	185	100	Rathborne, R Wm.	379	100	Greenleaf, Norris & Co.	435	35	Rathborne, R Wm.	221	100
Rathborne, R Wm.	186	100	Rathborne, R Wm.	380	100	Greenleaf, Norris & Co.	436	35	Rathborne, R Wm.	222	100
Rathborne, R Wm.	187	100	Rathborne, R Wm.	381	100	Greenleaf, Norris & Co.	437	35	Rathborne, R Wm.	223	100
Rathborne, R Wm.	188	100	Rathborne, R Wm.	382	100	Greenleaf, Norris & Co.	438	35	Rathborne, R Wm.	224	100
Rathborne, R Wm.	189	100	Rathborne, R Wm.	383	100	Greenleaf, Norris & Co.	439	35	Rathborne, R Wm.	225	100
Rathborne, R Wm.	190	100	Rathborne, R Wm.	384	100	Greenleaf, Norris & Co.	440	35	Rathborne, R Wm.	226	100
Rathborne, R Wm.	191	100	Rathborne, R Wm.	385	100	Greenleaf, Norris & Co.	441	35	Rathborne, R Wm.	227	100
Rathborne, R Wm.	192	100	Rathborne, R Wm.	386	100	Greenleaf, Norris & Co.	442	35	Rathborne, R Wm.	228	100
Rathborne, R Wm.	193	100	Rathborne, R Wm.	387	100	Greenleaf, Norris & Co.	443	35	Rathborne, R Wm.	229	100
Rathborne, R Wm.	194	100	Rathborne, R Wm.	388	100	Greenleaf, Norris & Co.	444	35	Rathborne, R Wm.	230	100
Rathborne, R Wm.	195	100	Rathborne, R Wm.	389	100	Greenleaf, Norris & Co.	445	35	Rathborne, R Wm.	231	100
Rathborne, R Wm.	196	100	Rathborne, R Wm.	390	100	Greenleaf, Norris & Co.	446	35	Rathborne, R Wm.	232	100
Rathborne, R Wm.	197	100	Rathborne, R Wm.	391	100	Greenleaf, Norris & Co.	447	35	Rathborne, R Wm.	233	100
Rathborne, R Wm.	198	100	Rathborne, R Wm.	392	100	Greenleaf, Norris & Co.	448	35	Rathborne, R Wm.	234	100
Rathborne, R Wm.	199	100	Rathborne, R Wm.	393	100	Greenleaf, Norris & Co.	449	35	Rathborne, R Wm.	235	100
Rathborne, R Wm.	200	100	Rathborne, R Wm.	394	100	Greenleaf, Norris & Co.	450	35	Rathborne, R Wm.	236	100
Rathborne, R Wm.	201	100	Rathborne, R Wm.	395	100	Greenleaf, Norris & Co.	451	35	Rathborne, R Wm.	237	100
Rathborne, R Wm.	202	100	Rathborne, R Wm.	396	100	Greenleaf, Norris & Co.	452	35	Rathborne, R Wm.	238	100
Rathborne, R Wm.	203	100	Rathborne, R Wm.	397	100	Greenleaf, Norris & Co.	453	35	Rathborne, R Wm.	239	100
Rathborne, R Wm.	204	100	Rathborne, R Wm.	398	100	Greenleaf, Norris & Co.	454	35	Rathborne, R Wm.	240	100
Rathborne, R Wm.	205	100	Rathborne, R Wm.	399	100	Greenleaf, Norris & Co.	455	35	Rathborne, R Wm.	241	100
Rathborne, R Wm.	206	100	Rathborne, R Wm.	400	100	Greenleaf, Norris & Co.	456	35	Rathborne, R Wm.	242	100
Rathborne, R Wm.	207	100	Rathborne, R Wm.	401	100	Greenleaf, Norris & Co.	457	35	Rathborne, R Wm.	243	100
Rathborne, R Wm.	208	100	Rathborne, R Wm.	402	100	Greenleaf, Norris & Co.	458	35	Rathborne, R Wm.	244	100
Rathborne, R Wm.	209	100	Rathborne, R Wm.	403	100	Greenleaf, Norris & Co.	459	35	Rathborne, R Wm.	245	100
Rathborne, R Wm.	210	100	Rathborne, R Wm.	404	100	Greenleaf, Norris & Co.	460	35	Rathborne, R Wm.	246	100
Rathborne, R Wm.	211	100	Rathborne, R Wm.	405	100	Greenleaf, Norris & Co.	461	35	Rathborne, R Wm.	247	100
Rathborne, R Wm.	212	100	Rathborne, R Wm.	406	100	Greenleaf, Norris & Co.	462	35	Rathborne, R Wm.	248	100
Rathborne, R Wm.	213	100	Rathborne, R Wm.	407	100	Greenleaf, Norris & Co.	463	35	Rathborne, R Wm.	249	100
Rathborne, R Wm.	214	100	Rathborne, R Wm.	408	100	Greenleaf, Norris & Co.	464	35	Rathborne, R Wm.	250	100
Rathborne, R Wm.	215	100	Rathborne, R Wm.	409	100	Greenleaf, Norris & Co.	465	35	Rathborne, R Wm.	251	100
Rathborne, R Wm.	216	100	Rathborne, R Wm.	410	100	Greenleaf, Norris & Co.	466	35	Rathborne, R Wm.	252	100
Rathborne, R Wm.	217	100	Rathborne, R Wm.	411	100	Greenleaf, Norris & Co.	467	35	Rathborne, R Wm.	253	100
Rathborne, R Wm.	218	100	Rathborne, R Wm.	412	100	Greenleaf, Norris & Co.	468	35	Rathborne, R Wm.	254	100
Rathborne, R Wm.	219	100	Rathborne, R Wm.	413	100	Greenleaf, Norris & Co.	469	35	Rathborne, R Wm.	255	100
Rathborne, R Wm.	220	100	Rathborne, R Wm.	414	100	Greenleaf, Norris & Co.	470	35	Rathborne, R Wm.	256	100
Rathborne, R Wm.	221	100	Rathborne, R Wm.	415	100	Greenleaf, Norris & Co.	471	35	Rathborne, R Wm.	257	100
Rathborne, R Wm.	222	100	Rathborne, R Wm.	416	100	Greenleaf, Norris & Co.	472	35	Rathborne, R Wm.	258	100
Rathborne, R Wm.	223	100	Rathborne, R Wm.	417	100	Greenleaf, Norris & Co.	473	35	Rathborne, R Wm.	259	100
Rathborne, R Wm.	224	100	Rathborne, R Wm.	418	100	Greenleaf, Norris & Co.	474	35	Rathborne, R Wm.	260	100
Rathborne, R Wm.	225	100	Rathborne, R Wm.	419	100	Greenleaf, Norris & Co.	475	35	Rathborne, R Wm.	261	100
Rathborne, R Wm.	226	100	Rathborne, R Wm.	420	100	Greenleaf, Norris & Co.	476	35	Rathborne, R Wm.	262	100
Rathborne, R Wm.	227	100	Rathborne, R Wm.	421	100	Greenleaf, Norris & Co.	477	35	Rathborne, R Wm.	263	100
Rathborne, R Wm.	228	100	Rathborne, R Wm.	422	100	Greenleaf, Norris & Co.	478	35	Rathborne, R Wm.	264	100
Rathborne, R Wm.	229	100	Rathborne, R Wm.	423	100	Greenleaf, Norris & Co.	479	35	Rathborne, R Wm.	265	100
Rathborne, R Wm.	230	100	Rathborne, R Wm.	424	100	Greenleaf, Norris & Co.	480	35	Rathborne, R Wm.	266	100
Rathborne, R Wm.	231	100	Rathborne, R Wm.	425	100	Greenleaf, Norris & Co.	481	35	Rathborne, R Wm.	267	100
Rathborne, R Wm.	232	100	Rathborne, R Wm.	426	100	Greenleaf, Norris & Co.	482	35	Rathborne, R Wm.	268	100
Rathborne, R Wm.	233	100	Rathborne, R Wm.	427	100	Greenleaf, Norris & Co.	483	35	Rathborne, R Wm.	269	100
Rathborne, R Wm.	234	100	Rathborne, R Wm.	428	100	Greenleaf, Norris & Co.	484	35	Rathborne, R Wm.	270	100
Rathborne, R Wm.	235	100	Rathborne, R Wm.	429	100	Greenleaf, Norris & Co.	485	35	Rathborne, R Wm.	271	100
Rathborne, R Wm.	236	100	Rathborne, R Wm.	430	100	Greenleaf, Norris & Co.	486	35	Rathborne, R Wm.	272	100
Rathborne, R Wm.	237	100	Rathborne, R Wm.	431	100	Greenleaf, Norris & Co.	487	35	Rathborne, R Wm.	273	100
Rathborne, R Wm.	238	100	Rathborne, R Wm.	432	100	Greenleaf, Norris & Co.	488	35	Rathborne, R Wm.	274	100
Rathborne, R Wm.	239	100	Rathborne, R Wm.	433	100	Greenleaf, Norris & Co.	489	35	Rathborne, R Wm.	275	100
Rathborne, R Wm.	240	100	Rathborne, R Wm.	434	100	Greenleaf, Norris & Co.	490	35	Rathborne, R Wm.	276	100
Rathborne, R Wm.	241	100	Rathborne, R Wm.	435	100	Greenleaf, Norris & Co.	491	35	Rathborne, R Wm.	277	100
Rathborne, R Wm.	242	100	Rathborne, R Wm.	436	100	Greenleaf, Norris & Co.	492	35	Rathborne, R Wm.	278	100
Rathborne, R Wm.	243	100	Rathborne, R Wm.	437	100	Greenleaf, Norris & Co.	493	35	Rathborne, R Wm.	279	100
Rathborne, R Wm.	244	100	Rathborne, R Wm.	438	100	Greenleaf, Norris & Co.	494	35	Rathborne, R Wm.	280	100
Rathborne, R Wm.	245	100	Rathborne, R Wm.	439	100	Greenleaf, Norris & Co.	495	35	Rathborne, R Wm.	281	

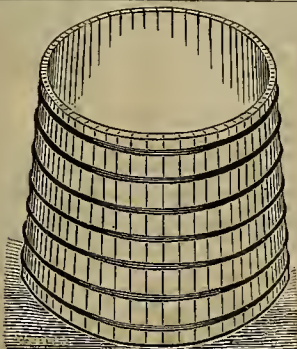
A Mica Bonanza.

This community is just now greatly excited over a mica ledge recently discovered and located by Frank Corbell and others, on Sinker creek, only about seven miles distant from town. It is said to be of an excellent quality and almost unlimited in quantity. We are informed that plates of it from four inches to two feet across can be obtained. If this be true, the boys are in possession of a bonanza of huge proportions than any quartz mine on the Pacific slope, the Consolidated Virginia not excepted. They are sinking on the ledge, and are said to be taking out blocks of solid mica of the size of a candle box. Mr. Corbell intends visiting the discovery, and will furnish us full particulars in regard to it when he returns.

In this connection a brief description of mica, its uses and value, will be of interest to our readers in general and to the people of this camp in particular at the present time: Mica is a mineral remarkable for its lamellar structure, and capable of being cleaved into plates of extreme thinness, many thousands of which are sometimes required to make the thickness of an inch. The most familiar form of mica is a constituent of granite, gneiss, mica, slate and some other kindred rocks. It is found both disseminated and in veins, and in many of the stratified rocks it is an incidental constituent derived from the destruction of the original formations to which it belonged. The colors of mica are various; the most common are silvery white, grayish, green, red and black. That found on Sinker is of a silvery white color. The principal mica mines in the world are in Siberia, Sweden, Norway, Canada and New Hampshire. Mica is used mostly for the doors of stoves and the sides of lanterns, for which it is well adapted by its transparency and refractory character. It is also employed as a substitute for window glass, and its toughness recommends it for this purpose on board vessels of war, in which the concussion from the discharge of guns would endanger the fracturing of glass. The value of good plates is about \$1 per pound.—*Quebec Avalanche*.

THE MINES OF NEVADA.—It is safe to say that at the present time the foundries of San Francisco are manufacturing for mines on the Comstock alone machinery which will cost \$2,000,000 or \$3,000,000. More than half the expenses of running these mines are left in that city. Indeed, there is not a mine worked here that is not a dividend paying mine to the men of San Francisco who sell goods or forge machinery. The best orders for goods are from Nevada; the highest machinery at the foundries is for Nevada; the biggest wire ropes are for Nevada; and so it goes, and so it has gone for a dozen years. The correct reasoning from all this is that mining—and silver mining at that—is the safest and surest business on this coast. And men with means should begin to see this and to reflect that while there is, so far as known, but one Comstock in the world, there are in Nevada a thousand undeveloped mines to be obtained cheaply, which, in the estimation of those best qualified to judge, hold ample returns for the little labor and money required to open them and reduce their ores. We have six or eight districts in mind full of these mines, and they are worth the careful attention of men who would make swift and sure fortunes.—*Virginia Enterprise*.

OVER \$1,400 was received at the Central Pacific ticket office at Reno, one day last week, for tickets to Cheyenne, bought by emigrants to the Black hills.



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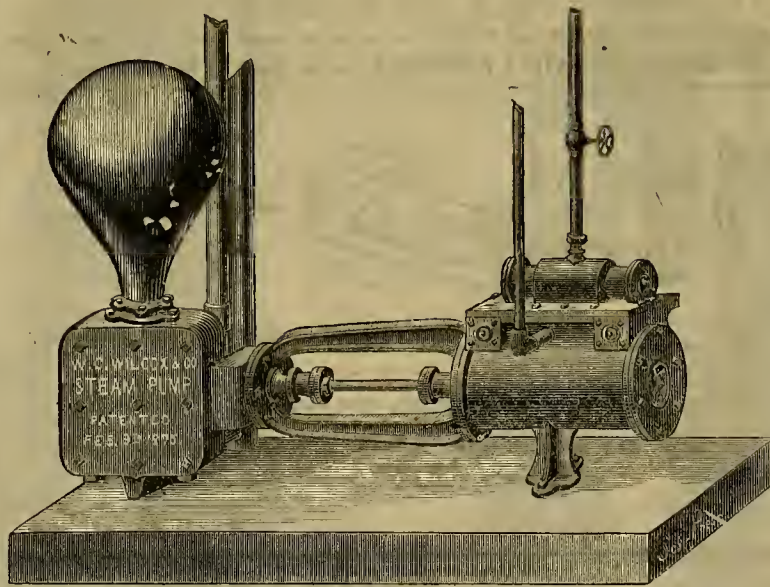
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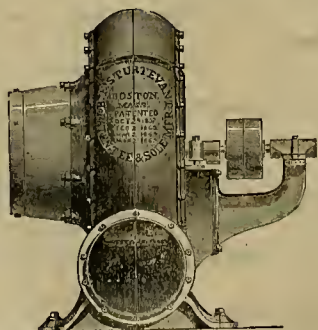
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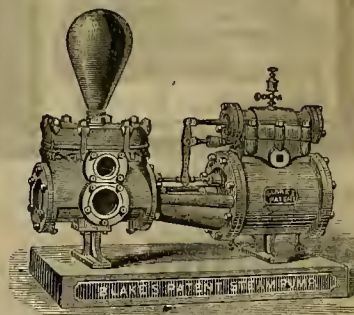
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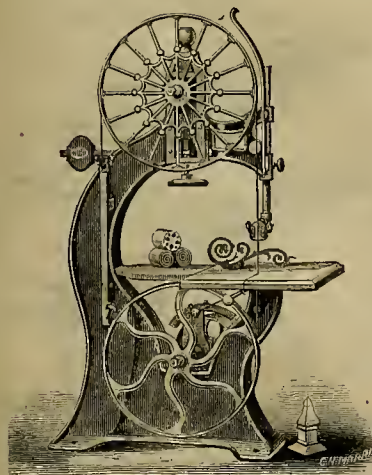
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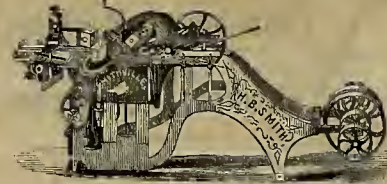


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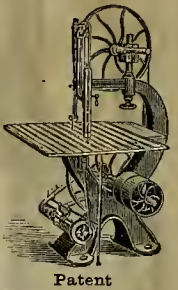
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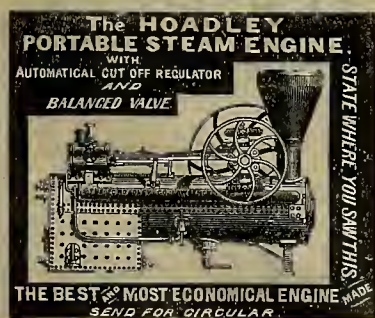
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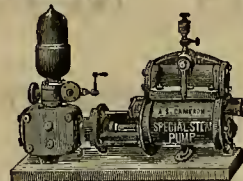
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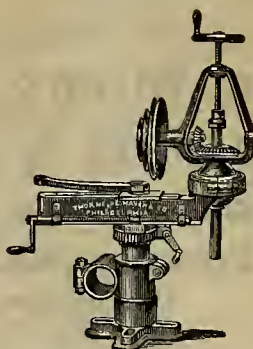
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SAN FRANCISCO, SATURDAY, APRIL 1, 1876.

VOLUME XXXII
Number 14.

A New Motor.

We illustrate herewith a new motor—the Rider compression engine—which has just been introduced on this coast by Huntington, Hopkins & Co., Nos. 2 and 8 Bush street. As its name implies, the chief feature of this engine is the use of highly compressed cold air, the thorough heating thereof without change of volume, and its efficient expansion to a point to or below the pressure of the atmosphere, thereby completely utilizing all the force or mechanical effect possible.

The imperative demand for a motor possessing the elements of safety, economy, simplicity and durability, has called forth, during the past century, the best efforts of the most eminent engineers both of Europe and America, as evinced by the many varieties of motors at present in existence, operated by gas, atmospheric air, carbonic acid, ammonia, electricity, etc.; but till very recently, steam has been pre-eminent in utility, notwithstanding its danger, high rate of maintenance, and total unfitness in the hands of inexperienced persons. A careful examination of all the motors mentioned above, shows that atmospheric air is the only agent at all likely to successfully compete with steam, from its universal presence, its low capacity for heat, and its capability of producing great power when properly applied.

As may be seen by the annexed sectional engraving, Fig. 2, the engine consists essentially of a compression cylinder, A, and a power cylinder, B, with their respective pistons, C, D, and connections, and a regenerator, H. The lower portion of the compression cylinder, A, is kept cold by a current of water which circulates through the cooler, E, which surrounds the lower portion of the cylinder, while the lower portion of the power cylinder is kept hot by the action of the fire below the heater, F. The heating and also the cooling of the air is instantaneously effected by its alternate presentation to the surfaces of the heater and cooler in a thin annular sheet.

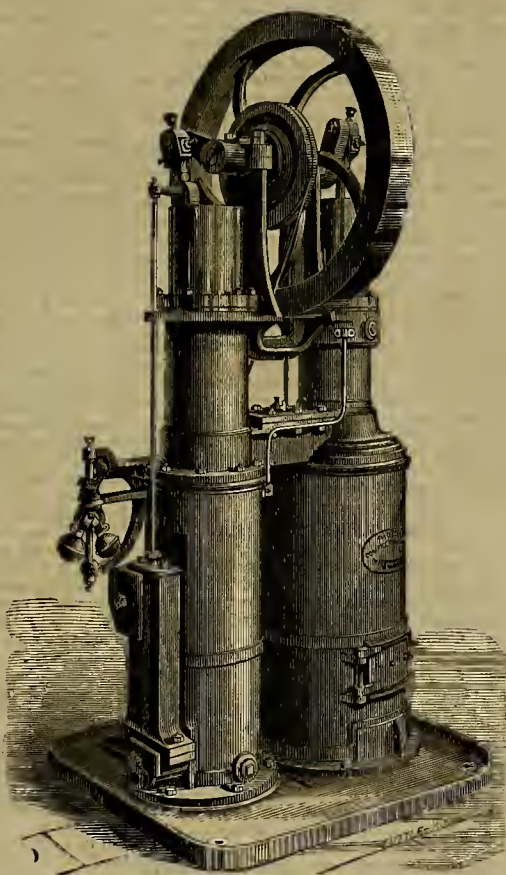
The compression piston, C, extends downward to the base of the engine, and is a trifle smaller than the interior of the cooler, E, thus leaving a thin space on all sides for the air to pass downward and become thoroughly cooled on its way to the bottom, and through which space it flows on its way back to the heater. The power piston, D, likewise extends downward into the heater, F, which presents to the action of the fire a narrow annulus all round the bottom. Within this heater is the telescope, G, which is a thin iron cylinder about one-fourth of an inch less in diameter than the interior of the heater. It is fitted to the interior of the power cylinder, and extends nearly to the bottom of the heater. Its office is to cause the air which flows from the compression cylinder to be presented in a thin sheet all round the interior surface of the heater, and particularly at the lower and hotter portion. By this means the air is thoroughly and rapidly heated.

The same air is used continuously, as there is neither influx nor escape, the air being merely shifted from one cylinder to another. Between the compression and power cylinders is situated the regenerator, H, composed of a number of thin plates slightly thickened at their edges, which, while affording a free passage to the air, subdivides it into thin sheets. It is so placed between the cylinders as to be traversed by the air in its passage each way between the hot and cold cylinders.

The other portions of the engine are readily

understood on the inspection of the engraving. The two pistons are attached directly to the cranks, I, I, by simple connecting rods, J, J, and all the movements of the various parts are uniform, being solely derived from regular, circular, and rectilinear motion; and as there is an entire absence of all complicated parts and the irregular intermittent impulses which characterize caloric engines, a high rate of speed and smooth action may be safely and easily obtained. K, K are the packings, which are in duplicate for each cylinder. The lower one has its lap downward to resist the escape of air below the piston, while the upper one has its lap upward to prevent the lubricating material from entering too freely into the cylinder. Between them is a patent relief ring to relieve the friction of the packings. L is a

Fig. 1.



THE RIDER COMPRESSION ENGINE.

simple check valve which supplies any light leakage of air which may occur.

The operation of the engine is briefly as follows: The compression piston, C, first compresses the cold air in the lower part of the compression cylinder, A, into about one-third its normal volume, when, by the advancing or upward motion of the power piston, D, and the completion of the down stroke of the compression piston, C, the air is transferred from the compression cylinder, A, through the regenerator, H, and into the heater, F, without appreciable change of volume. The result is a great increase of pressure corresponding to the increase of temperature, and this impels the power piston, D, up to the end of its stroke. The pressure still remaining in the power cylinder, and reacting on the compression piston, C, forces the latter upward till it reaches nearly to the top of its stroke, when, by the cooling of the charge of air, the pressure falls to its minimum, the power piston descends, and the compression again begins. In the meantime the heated air, in passing through the regenerator, has left the greater portion of its heat in the regenerator plates, to be picked up and utilized on the return of the air towards the heater. As

may be seen by Fig. 1, this pump is placed on the side of the cooler, and worked directly from the compression piston. All the water is passed directly through the cooler on its way to the tank or outlet.

These motors are valveless, noiseless, simple, and claimed to be absolutely safe; emit no heated air or unpleasant odor, as is the case with caloric engines; require no steam, cannot explode, do not increase risk of fire or cost of insurance, and can be operated by any one who can manage an ordinary stove.

They are well adapted for running all kinds of light machinery, printing establishments, etc., but are particularly valuable for pumping. One of these little six inch pumping engines (household size) has, we are informed, pumped for six months, without intermission or stoppage

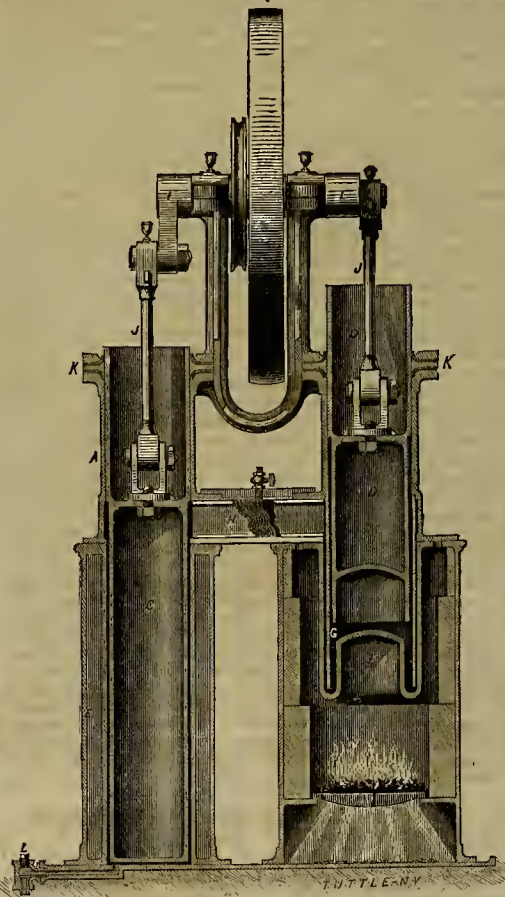
will be started up in a few minutes should any one desire to examine it. The engines are made in several sizes, but are intended simply as small motors and are not made to compete with large steam engines. Those who have need of such a motor should not fail to examine this new machine, if only as a matter of interest.

Consolidation of Mining Companies.

The following is the full text of the bill passed by the Legislature and signed by the Governor with reference to the consolidation of mining companies:

An Act to add another Section to the Civil Code, Section 1. An additional section is added to the Civil Code, to be known as Section 361, and to read as follows: It shall be lawful for two or more corporations formed, or that may hereafter be formed, under the laws of this State, or mining purposes, which own or possess mining claims or lands adjoining each other, or lying in the same vicinity, to consolidate their capital stock, debts, property assets, and franchises in such manner and upon such terms as may be agreed upon by the respective Boards of Directors or Trustees of such companies so desiring to consolidate their interests; but no such consolidation shall take place without the written consent of the stockholders representing two-thirds of the capital stock of each company; and no such consolidation shall in any way relieve such companies, or the stockholders thereof, from any and all just liabilities; and in case of such consolidation, due notice of the same shall be given by advertising for one month in at least one newspaper in the county and State where the said mining property is situated, if there be one published therein, and also in one newspaper published in the county or city and county where the principal place of business of any of said companies shall be. And when said consolidation is completed, a certificate thereof, containing the manner and terms of said consolidation, shall be filed in the office of the County Clerk of the county in which the original certificate of incorporation of any of said companies shall be filed, and a copy thereof shall be filed in the office of the Secretary of State. Such certificate shall be signed by a majority of each Board of Trustees or Directors of the original companies; and it shall be their duty to call, within 30 days after

Fig. II.



the filing of such certificate, and after at least 10 days' public notice, a meeting of the stockholders of said companies so consolidated, to elect a Board of Trustees or Directors for the consolidated company for the year then next ensuing. The said certificate shall also contain all the requirements prescribed by section 296 of said Civil Code.

Seco. 2. This Act shall apply to all corporations formed under the laws of this State, whether formed under said Civil Code, or prior thereto.

Seco. 3. This Act shall take effect from and after its passage.

It is stated that a miner, named Munson recently found in the Globe mining district, Arizona, a solid mass of metallic silver ore lying on the surface of the ground, and weighing 2,200 pounds. A careful assay of it showed it to be almost a mass of pure silver, and worth at least \$20,000.

L. STANWOOD, an employee in the Gould & Curry mine and formerly foreman in the Savage, died suddenly at Virginia City on Thursday.

from derangement, each consecutive day of 10 hours, 10,000 gallons of water to a height of from 70 to 100 feet; and the engine required the services of an attendant less than 30 minutes each day, and consumed only 20 pounds of coal per day, thus pumping 2,000 gallons of water 100 feet high at a cost of only one cent. The engine is extremely simple. It has not a valve, spring, cam, lever, eccentric, or any loose or delicate part about it to get out of order. As to economy, we are told that it takes only from 20 to 30 pounds of coal to run a one-horse power engine for 10 hours. As there is no steam or danger of explosion no engineer is required, as it only needs some one to fire it occasionally and keep the bearings oiled.

These engines are well adapted for nurseries, breweries, tanneries, supplying fountains, irrigating, pumping water for cattle, etc. On farms they would be of great value as they require no care, and if neglected will simply stop work and not blow up, as the best steam boiler is apt to do if not taken care of. These engines can be put to a great variety of uses and are not at all complicated or expensive. One can be seen in operation at any time at the store of Huntington & Hopkins. If it is not running it

THE ENGINEER.

Carrying the Sea to Inland Cities.

Among the numerous engineering projects of the age, that of carrying the sea to inland cities is, perhaps, one of the most important. The first project of this kind was that by which Glasgow has been made the chief port of entry for Scotland. Situated about midway between the opposite coasts of that country, and on the banks of a river where formerly in some places only from two to three feet of water could be found, it was determined to deepen said river as to enable deep-water ships to come up to the city. Up to 1851 nearly \$10,000,000 had been spent in bringing about that result and in preparing the three miles of wharves and docks to accommodate the shipping. The enterprise has proven a most successful one and the outlay most profitable. The net income from these improvements is now about \$800,000 annually, to say nothing of the immense increase of population and wealth which they have brought to the city.

The Sea Coming up to Manchester.

And now, profiting by the example of Glasgow, the inhabitants of Manchester have also determined to bring the sea directly up to the looms of the great Cottonopolis of England. The promoters of the Manchester scheme propose to strengthen, deepen and widen the little river Irwell, by which that city stands, down to its junction with the Mersey, and to apply the same process to the latter river down to Liverpool, so that the grain-laden ships of California and the cotton ships of the Southern States can land their cargoes just where they are wanted for consumption and use.

This improvement, which will cost from \$17,000,000 to \$18,000,000, will provide a tidal canal for sea-going ships from Manchester to the sea, 33 miles in length, 200 feet in width and 22 to 25 feet in depth. The ships will be taken through the canal by tug, as they are now moved through the Suez canal.

With these projects in view, completed and contemplated, it cannot be many years ere we shall behold

The Sea Carried up to Stockton.

Which is destined to become one of the great inland cities of California. The importance of such a project, in view of the rapidly increasing commercial value of the great San Joaquin valley, will soon render it possible that such a work can be made a paying enterprise. There are no engineering difficulties in the way at all comparable to the deepening of the channels from either Glasgow or Manchester to the sea. The entire distance from Stockton to Venice, on the San Joaquin, whence a natural channel of efficient depth is continuous to the sea, is a perfect level, through every foot of which an ordinary steam dredger can be used.

In addition to the value of such a canal for commercial purposes it will also provide an increased channel capacity for carrying off floods, which will greatly aid in rendering practical and safe the numerous reclamation improvements now in progress all through that section of the State. The attention of capitalists has already been called to the need and importance of the enterprise, the cost of which will be small in comparison to the advantages which cannot fail to accrue from its realization; while, if we judge from the already completed work at Glasgow and the proposed enterprise at Manchester, it would offer a highly profitable investment for those who may supply the capital. The people of the San Joaquin valley already consider the construction of this proposed ship canal a mere matter of time. In all probability it will become the third engineering work of the kind in the history of modern commercial enterprise.

An American Engineer's Triumph.

Notwithstanding the many doubts thrown out against the probability of the success of Captain Eads' present efforts to open a deep ship channel through the mouth of the Mississippi by means of the jetty system, he has already accomplished far more than he had ever supposed possible at the present early stage of that enterprise. Recent dispatches from New Orleans announce the passage out to sea of well freighted cotton ships through the jetties at the South pass, which are as yet but partially constructed.

When the work of this jetty system was commenced a year or so ago, the bar on that pass had but seven feet of water upon it; now it has a depth of nearly twenty feet, a depth almost incredible to all but the engineers in charge. It seems from all advices, and from those business men from England and St. Louis, and other points interested in the success of this enterprise of Captain Eads, who have recently visited the jetties, that this masterly triumph of science over the continual obstructions created at the mouth of the Father of Waters is a fixed fact.

This recalls what Captain Eads spoke to the citizens of St. Louis at a recent banquet given by them in his honor when he was on the point

of starting on this enterprise of deepening the mouth of the Mississippi:

"If the profession of an engineer were not based upon exact science I might tremble for the result, in view of the immensity of the interests which are dependent on my success. But every atom that moves onward in the river from the moment it leaves its home amid the crystal springs or mountain snows, throughout the 1,500 leagues of its devotional pathway, until it is lost in the vast waters of the gulf, is controlled by laws as fixed and certain as those which direct the march of the heavenly spheres. Every phenomenon and apparent eccentricity of the river, its ebbing and depositing action, its carving banks, the formation of the bars at its mouth, the effect of the waves and tides of the sea upon its currents and deposits, are controlled by laws as immutable as the Creator, and the engineer needs only to be assured that he does not ignore the existence of any of these laws, to feel positively certain of the result he aims at. I therefore undertake the work with a faith based on the ever constant ordinances of God Himself."

Mechanical Engineering.

In mechanical engineering the past year has given us no remarkable novelty, although it has not been wholly barren of results. Renewed attempts have been made to introduce steam of very high pressure as a means of economizing fuel; and much ingenuity and energy have been, and will be, we fear, wasted in the pursuit of delusive advantages which never can be realized. All arguments in favor of high pressures are based on the assumption that by using them steam can be expanded a greater number of times than is possible when low pressures are employed, and that the more expensively steam is employed the further a given weight of the fluid may be made to go. Thus, for example, if a given weight of steam is used without expansion and does work represented by 1, by expanding it five times we can increase the work to about 2.5, and by expanding it a hundred times we could raise the duty to about 5.6. Now it is known that the gain due to expansion has nothing to do with the pressure; but the terminal pressure in a cylinder is settled by the amount of vacuum which can be obtained. The lowest practical terminal pressure is about five pounds on the square inch, but long before this point is reached the work done by the steam will be expended in overcoming frictional resistance; it will be useless work, in fact.

Experiments have proved that the lowest available terminal pressure is eight pounds to the square inch. It is obvious that if we attempt to expand steam, say 50 times, we must have an initial pressure, under the conditions, of eight times 20, or 160 pounds on the square inch. If a 30 fold expansion be attempted, then the initial pressure must be 240 pounds. It is, then, only because engineers attempt to employ great measures of expansion that high pressure steam is regarded with favor.

Up to a period of 10 or 12 years since, it was taken for granted that steam followed Mariott's law in expanding, and the coincidence for it is nothing more—of good diagrams with the operation of this law, lent additional strength to a pure delusion. Mr. Isherwood, of the United States, was the first to show in practice that when expanding in a steam engine, steam does not obey Mariott's law, and that its consumption increased enormously as the ratio of expansion is augmented. The influence of the condenser tells heavily against great measure of expansion. Watt's so-called separate condenser is only equivalent in its effects to what would have followed if he had lengthened the cylinder of a single-acting engine, and worked the piston at one end of this cylinder while he condensed at the other. In a word, the phrase "separate condenser" is a misnomer, and conveys a false impression.—*The Engineer.*

The American Institute of Mining Engineers.

This active and useful organization held its fourth regular annual session at Washington, during the last week in February. The organization was founded in 1871, and has rapidly increased in numbers and influence, until it has now about 600 names enrolled on its list of membership. It is the largest technical association in the United States. It is national in character, and is composed of the leading mining, civil and military engineers, metallurgists and chemists of the country.

A leading feature of the Institute, and one which will perhaps prove most valuable to the Pacific coast, is the regular appointment of active and capable committees to examine into doubtful metallurgical and mining questions. A report of one of these committees formed an important subject of consideration at the late meeting of the Institute—a committee co-operating with the United States Commission on Iron and Steel Tests.

This Institute intends, during the Centennial exhibition, to keep rooms open for the use of members, associates and others interested, at 1,123 Girard avenue, Philadelphia, and to have, beside this, their headquarters on the Centennial grounds. It will serve as a center of reunion and place of resort for all engineers, metallurgists, geologists, etc., and a general agency for the profession.

Horse Shoes.

A writer in the *Boston Commercial Bulletin* says: It would expand the eye of one of our old blacksmiths—the one, for instance, who hammered out the sparks "under the spreading chestnut tree"—could he behold the manner in which horse shoes are "turned out" in these latter days. Machinery, like some omnipotent monster, fashions, with equal ease, a pin or a steam engine, and outtrides itself into all branches of industry; but it did seem as if horse shoes were forever beyond its reach. But not so. Since it was a trifling matter for machinery to become a shoemaker for man, it isn't likely that it could long be kept from making shoes for man's faithful servant, the horse. Accordingly, we see to-day ingenious mechanisms that make more shoes in one hour than the village blacksmith could forge in a week, and, what is more, if the machine has any conscience or eye for reputation, it can make just as good shoes as these made by hand.

There is a prejudice against machine made shoes, however, from the fact that an inferior quality of iron may be, and often is, used. Shoes made by hand, on the contrary, must be of good iron, because in cutting the crease and punching the heel poor stock would be sure to crack; whereas, by machine process, the punching and creasing are done without much strain on the metal. The only security a man has for a good shoe is the trade mark of a house that warrant their goods; because it is to the interest of the blacksmith to put cheap shoes on a horse. He gets about \$2.50 for the job, shoes included. Hand made shoes cost about nine cents a pound and machine made six, consequently it is so much "in" if he uses the latter; not to mention the possibility of another job much sooner than should otherwise be needed.

Horse shoeing about once a month on an average, the hind shoes giving out first, partly because of the greater strain on the rear hoofs and partly by reason of the sudden jerks, which have the constant tendency to throw off the shoe. The danger from a loose shoe is that it may throw or cut the horse, and so, perhaps, fatally injure it. A shoe made of inferior stock is apt to break in the center, with serious consequences to both horse and driver; hence owners of good animals are particular in having the best hand made shoes. A good shoe can be forged over when the horse outgrows it, which is also to the advantage of the smith.

Everybody, we suppose, has seen a horse shoe forged. Everybody remembers the time when, a little boy, he stood at the smithy door and listened to the wheezing of the anvil below. Presently the brawny armed workman plucked a piece of glowing iron from the fierce fire and began pounding it with his hammer and cringing it over the pointed end of the anvil. Again he heated and again he pounded—maliciously as you thought, causing the hissing sparks to fly in your face. Presently you beheld a horse shoe forming under his sturdy strokes. It was a slow, laborious and tedious process. Now you may witness horse shoeing out of a sheet of iron like doughnuts; or you may see another infernal machine chew up a red hot bar of iron and spit out horse shoes by the ton, all shaped, hammered, creased and punched precisely as if done by hand, and equally as good in all respects.

Contraction of the Earth.

An eminent French geologist has been attempting to calculate, on the basis of certain allowable suppositions, the amount, in volume, of the solid shell of our earth which must be crushed annually, in order to allow the shell to follow down after the more rapidly contracting nucleus. He shows that the amount of crushed and extruded rock necessary for the supply of heat for the support of existing volcanic action can be supplied by that extruded from a shell between 600 and 800 miles thick, and that the volume of material, heated or molten, annually blown out from all existing volcanic cones could be supplied by the extruded matter from a shell of 200 to 400 miles in thickness. On data which seems tolerably reliable, this investigator has further been able to calculate, as he believes for the first time, the amount of annual contraction of our globe, and to show that, if that be assumed constant for the last 5,000 years, it would amount to a little more than a reduction of three and one-half inches on the earth's mean radius.

At the rate of contraction of three and one-half inches in 5,000 years, as above noted, it would require 90,000,000 of years to diminish the earth's radius by one mile; and, therefore, if there be any correctness in these data, the resulting figure expressing the age of the earth will be large enough to satisfy all the demands of the most extreme geological theories.

A CAR LOAD.—It is now a matter of interest to many people to know what constitutes a car load. Nominally, a broad gauge car load is 20,000 pounds, dead weight, as follows: 70 barrels lime, 70 barrels salt, 90 barrels flour, 60 barrels whiskey, 200 sacks flour, 340 bushels wheat, 300 bushels corn, 680 bushels oats, 400 bushels barley, 360 bushels flaxseed, 360 bushels apples, 430 bushels Irish potatoes, 360 bushels sweet potatoes, 1,000 bushels bran, 6 cords soft wood, 4 cords hard wood, 18 to 20 head cattle, 50 to 60 hogs, 80 to 100 sheep, 9,000 feet solid boards, 17,000 feet siding, 15,000 feet flooring, 40,000 shingles, 20,000 do. hard timber, 10,000 do. green timber, 40,000 feet joist, scantling and all other large timbers.

The Gatling Gun Improved.

The *Hartford Times* says: Dr. R. J. Gatling, the inventor of the well known gun, is one of those peace men who believe that it is better to attempt to make war unprofitable by appealing to fear than to make peace possible by appealing to love. If two contending armies are certain to be annihilated in the first general battle, there will be few battles. At least this seems to be the theory of his machine gun; it has immensely increased man's power for the disabling and destruction of his enemy. The Gatling gun is a group of rifle barrels arranged around a central spindle or axis, revolved by simple mechanism, and loaded and fired by equally simple devices. It differs from the revolving pistols in the fact the revolvers fire only when the barrel and the loading mechanism are at rest, while the Gatling gun fires only when the entire mechanism is in active operation. At all times during the working of the gun, each cartridge that has entered the loading cylinder, at the rear of the barrels, is in process of being placed in one of the barrels and fired, or its empty shell is being withdrawn. The result is a firing so rapid that its noise is continuous, and the ear is quite unable to distinguish the successive discharges. Heretofore each gun has had ten barrels; but recent improvements have made it possible to secure as good results from five barrels as formerly from ten. This has greatly reduced the weight of the piece, diminished the chances of a disarrangement of any of the parts, and increased the gun's effectiveness by making it more portable. This is the most striking change noted by the ordinary observer in comparing this new model and the former style.

But some other changes have been made that are fully as important, though not so easily made plain to the general reader by description. The rapidity of working the gun has been increased by attaching the operating crank directly to the revolving shaft, instead of employing the medium of worm and wormgear. The cartridges are fed directly over the center, insuring their passage to the interior of the barrel without possibility of failure. The mechanism to produce the sweeping motion intended for operating over a radius of a horizontal circle, has been simplified by substituting a cam for the double screw. This cam moves the pieces through four degrees, and a simple adjusting screw increases this 15 degrees, so that the sweep of the gun may be made to describe an arc of 20 degrees without moving the carriage, tripped or swivel upon which the gun is mounted. The frame of the new gun is a single bar passing longitudinally under the gun, instead of two side bars. Some will be made, the support of which will be a case surrounding the barrels and furnished with trunnions on the outside. This will give the smaller size of gun very much the appearance of a howitzer, as the case will be made of bronze. In fact, the new model gun has a case to cover the barrels as a protection from rust, dirt and casual injury.

By these and other minor changes one of the smaller sized guns is reduced in weight from 135 to 98 pounds. On the larger sizes the reduction may not be so large proportionately, but it is sufficient to make a favorable item. The efficiency of the gun is increased—a late trial giving 1,000 shots per minute with a five barreled gun. Any one of the locks can be withdrawn instantly in case of injury, and still the gun may be fired, losing only so much of its efficiency as the proportion of the removed lock is to the remainder. This gun is made of varying calibers, including all the rifle calibers used by civilized nations, and heavier calibers up to the half-pound shot of one inch diameter with an effective range of two and a half miles.

Tea—Its Culture in California.

A writer in the *Chronicle*, who has traveled extensively, says: The tea plant grows better in California than in China, but to the aqueous infusion it yields no thiene, which is the esteemed element. The tea plant grows well in California. We have seen a million of them, in full and luxuriant growth, among the foothills between Georgetown and Placerville. We tasted the infusion from its leaves, served Japan fashion, which differs materially from Chinese methods. Instead of iron plates, heat is applied to the leaf from Japan, through a porous paper, expressly made, so that there is no burning nor overheating. We have taken tea which came from Assam and also from the vast tea gardens of the snowy Himalayas; and between teas of China and Japan there is a marked difference. The teas of India are too rank; they are only used to give pronounced flavor to the teas of China, which are growing year by year more insipid. We are not surprised to find in this first tea of California quite a difference from all others. It was not rank but delicate; and considering that it was rudely prepared and fired through Japan tea paper in haste for our industrial fair, we judged that tea culture may be a success in California when it can be economically aided by machine preparation. The tea plants of El Dorado were all destroyed by a casualty that is avoidable in the future. The experiment otherwise proved that with irrigation tea will grow first rate in our foothills, and all the better where snow covers the brush for 60 days.

There are now 25 men engaged in graveling and leveling the railroad track between Walla Walla and Wallula.

SCIENTIFIC PROGRESS.

The Temple of Belus—Some Interesting Discoveries.

Mr. George Smith states, in the *London Athenaeum*, that he has recently discovered, in his researches amid the ruins of Nineveh, an ancient tablet which gives a remarkable account of the temple of Belus (the ancient tower of Babylon), in which are given the principal points of arrangement and dimension of this remarkable structure.

This temple was the grandest religious edifice of the age—the center of religious worship and the wonder of the world. It was founded centuries before Babylon became the chief city and capital of the State, and retained its fame even down to the commencement of the Roman empire.

Our knowledge of this structure has heretofore been confined to what Herodotus and Strabo have told us of it. They tell us that the principal building was one story in length and breadth and high, and that it consisted of eight stories or towers, one above another, the whole forming a pyramidal shape—the highest being the chief sanctuary or holy of holies of the Babylonian worship. A stade has been supposed to be 600 feet, which would give the dimensions of the structure as 600 feet square and 600 feet in height.

But the tablet which Mr. Smith has brought to light, and which undoubtedly gives the correct measurement, changes those figures very considerably.

First, in the tablet we have the measure of the inner enclosure, called the "Grand Court," which is given at 1,156 feet in length and 900 feet in breadth. The next court is called the "Court of Istar or Zamma," which is set down at 1,056 feet in length and 450 feet in breadth. Round this court were six gates, admitting to the inclosed temples. Even the names of these gates are given. The four walls of the courts, like the great pyramid in Egypt, faced the four cardinal points, and in this the faces or sides of all the other portions of the structure agreed. The extent of the next enclosure appears to be uncertain; it had four gates or entrances—the gate of the rising sun, the southern gate, the gate of the setting sun, and the northern gate. Each of these three enclosures seem to have been on a level with the general plain on which Babylon stood, and were simply walled paved courts, open at the top, and one within the other.

In the center of the third enclosure stood the "tower" or principal building, which was the grandest portion of the whole pile, the foundation of which was 300 feet square, and the entire height, above the foundation, also 300 feet. The lower stage or story was 300 feet square and 110 feet high. The next or second stage of the tower was 260 feet square and 60 feet high. The epithet applied to this stage is obscure; it had probably sloping sides. The third stage differs widely from the lower ones, and commences a regular progressive series of stages, all of equal height. It was 200 feet square and 20 feet high. The fourth stage was 170 feet square and 20 feet high. The fifth stage was 140 feet square and 20 feet high.

Probably by accident, the dimensions of the sixth stage of the tower are omitted in the inscription, but they can be easily restored in accordance with the others. This stage must have been 110 feet square and 20 feet high. On this was raised the seventh stage, which was the upper temple or sanctuary of the god Bel.

This building had a length of 80 feet, by 70 feet broad and 50 feet high.

Thus the whole height of this tower above its foundation was 300 feet, exactly equal to the breadth of the base; and, as the foundation was most probably raised above the level of the ground, it would give a height of over 300 feet above the plain for this grandest of Babylonian temples.

This grand central tower or temple was surrounded with a number of smaller buildings, the chief of which, and the one which appears to have been most intimately connected with the principal structure, was 200 feet square. Beyond this, and around the base of the tower, were arranged the chapels or temples of the principal gods, on its four sides, and facing the cardinal points. On the eastern side stood a sanctuary or temple, 117 or 133 feet by 67 feet, with 16 shrines, the principal being the shrine devoted to the god Nemo and Urmit or Trasmir his wife. Nemo was considered the eldest son of Bel, the great deity of the temple. On the northern side stood two temples, one devoted to the god Hea, the other to Nusku. The temple of Hea was 142 feet long by 50 feet broad, and that of Nusku was a square, 58 by 58 feet. On the southern side stood a single temple, dedicated to the two great gods, Ann and Bel. This was 117 by 50 feet. On the western side were the principal buildings, consisting of a double house, with a court between the two wings. On the one side the wing was 166 by 34 feet, on the other side the wing was 166 by 108 feet, and the space between them was 58 feet. The building at the back was 208 by 50 feet. The description of the position of the western temples must be taken as conjectural. In

these western chambers stood the couch of the god, and the throne of gold mentioned by Herodotus, besides other furniture of great value. The couch is stated to have been 15 feet by 6 feet 8 inches in area.

The mound of Babil, which is already identified by the best authorities with the temple of Belus, consists now of the lower stage of the tower and the ruins of the buildings around it. We can only conjecture that the magnificent superstructure was removed by Alexander in his operations for clearing the site and rebuilding the temple, a work he did not live to accomplish.

The adornment of the temple of Belus with gold and silver, the splendid colors of its furniture and statuary, combined to make it one of the grandest buildings of the ancient world, and earned for it the name of the "Basis of Heaven and Earth," and the "Glory of the City of Babylon."

The discovery of these and other tablets—constituting the books and libraries of that ancient people—are among the most interesting scientific discoveries of the age. Their number seems almost without limit, and the information which they are bringing down to us from those far off ages is of the most important character. The constantly recurring reports of new discoveries in this direction, keep up the interest, and will tend to secure, beyond peradventure, the funds necessary to continue the work of exploration, so long as the discoveries continue. This field of research seems almost inexhaustible.

AN INTERESTING EXPERIMENT.—There are some substances—arsenic, for example—which under ordinary atmospheric pressure pass from the solid to the gaseous state without first fusing; whereas, with increased pressure, they can be fused. A good lecture experiment for showing that the phenomenon depends on pressure has been described by M. Meyer, to the Berlin chemical society. Into two similar tubes, with one end open, are introduced a few grammes of iodine. The upper open ends are drawn out, the air is removed from one of the tubes, while that in the other is gently heated; then both are closed by fusing. The iodine in the two tubes is now heated with a Bunsen burner. In the air-containing tube the iodine fuses, while a colored almost opaque vapor is given off, and on turning up the tube the fused iodine runs down and solidifies again on the cold sides. In the vacuum tube, on the other hand, the iodine does not fuse, but is at once vaporized, and a vapor cushion is formed between the crystals and the glass, as in Leidenfrost's phenomenon. The vapor is but little colored and quite transparent; because, air being absent, it rises at once to the cold parts of the tube and forms a ring of sublimated iodine.—*Boston Jour. of Chemistry.*

OCEAN CURRENTS.—Prof. Wyville Thomson, director of the civilian scientific station still on board the *Challenger*, reports to the admiralty that the trough of the Pacific ocean, like that of the Atlantic, is by an enormous mass of cold water near the bottom, which appears to be an indraft from the Antarctic ocean, constantly moving northward. We know that the same thing takes place in the Atlantic, where a cold under-current moves from the Arctic regions to the equator, while on the surface a warm current (the gulf stream) moves in the opposite direction from the equator to the pole. The cause is nothing but the difference in specific gravity; in cold regions the water of 39 deg. Fahr., being most dense, will sink and make place for the warmer water, which will overflow it on top, coming from the warm regions, where the cold water will ascend and be heated by the solar rays, and flow toward the poles. This motion is governed by the same law as air, heated at one place and cooled at the other; at the cold place the air will descend, flow over the bottom to the warm place, ascend there, being heated, and flow from the heated place on top in a contrary current over the cold air, thus establishing a constant circulation.

THE ELECTRIC LIGHT IN PARIS.—We learn from recent foreign journals that the luggage room of the Paris terminus of the Great Northern railway has been lighted by means of electricity for some days, and so successful has the experiment proved that it has been decided to light all the waiting and baggage rooms of the principal Paris railway stations by means of electricity. By working the Gramme machine with three-horse power, as much light is obtained as that given by a hundred gas burners. The electric lantern is placed at a height of 10 meters (about 32 feet) from the ground, and sheds a soft, clear light over an area of 20,000 square feet.

In reference to the amount of carbonic acid excreted in the breath and perspiration by different animal species under the same conditions, and by the same species under different conditions, Dr. Pott finds that the greatest amount of carbonic acid per 100 grms. of living weight is excreted by birds (4.93 grms. in six hours); next follow mammals (2.95 grms. in six hours), and then insects. Young animals excrete a proportionately greater weight than old ones.—*Chem. News.*

INTERNAL CONSTITUTION OF MAGNETS.—In the *Comptes Rendus*, for January 3d, 1876, M. J. Jamin shows that a bundle of steel plates will always be stronger than a single bar of steel of the same dimensions, and the proportion will increase indefinitely with the number of the plates. This view justifies the use of slender laminæ in the construction of magnets.

MECHANICAL PROGRESS.

Our Iron Industry.

A large share of attention is of late being drawn to the iron industry of the South, through a district of country embracing the southern portion of West Virginia and thence south to the northern portion of Georgia and Alabama. In addition to a superabundance of the ordinary iron ores of the very best quality, many veins of manganese are also found there; also black oxide of great purity, brown hematite and magnetic ores. "Brown ochreous ore" occurs, with from 53.20 to 58.80 per cent. of metallic iron.

Many of the ores found there are of the very best character for the production of Bessemer steel, and many, not strictly Bessemer ores, have gained high favor as furnace ores for foundry and mill irons, both from the fluidity and from the unusual strength of the resulting metal. In 1874 a series of most satisfactory tests of various pig irons from these ores was made at Providence, R. I., with the Government machine for testing gun metal. The irons were of anthracite make, and among them was found, so far as known to the experimenters, the strongest anthracite iron on record. The iron from most of these ores is remarkably free from sulphur.

Who shall estimate the importance of this iron producing region in the near future? It is located in a fertile agricultural region, convenient to an abundance of the best coal, and in convenient railroad connection with all parts of the Union. Foreign capital is fast becoming interested in these properties, and the prophecy is ventured that the products of this region will soon secure the control of the iron market of the Atlantic coast, and eventually be able to compete successfully with British iron and steel in the English markets.

The iron region of West Virginia is within 100 miles of tide water and ocean navigation at Richmond, where navigation is never closed, even in the coldest season.

The Iron Works of the United States.

No greater evidence of the sure and rapid progress of the iron interest of the United States can be given, than is contained in a small "Centennial" publication of 140 closely printed pages, recently put forth by the American iron and steel association. A summary of the prominent facts more fully treated upon in the book is given below:

Whole number of completed blast furnaces, Jan. 1st, 1875.....	713
Annual capacity of all the furnaces, in net tons.....	5,439,230
Whole number of rolling mills, Jan. 1st, 1875.....	332
Whole number of single puddling furnaces, (each double furnace counting as two single ones).....	4,474
Total annual capacity of all rolling mills in finished iron, net tons.....	4,189,760
Annual capacity of all the rail mills in heavy rails, net tons.....	1,940,300
Number of Bessemer steel works, Jan. 1st, 1875.....	11
Annual capacity in ingots, net tons.....	500,000
Number of Bessemer converters.....	24
Number of open-hearth steel works, Jan. 1st, 1875.....	16
Number of open-hearth furnaces.....	22
Annual capacity in ingots, net tons.....	45,000
Number of crucible and other steel works, Jan. 1st, 1875.....	30
Annual capacity of merchantable steel, net tons.....	108,250
Of which there are of crucible steel, in net tons.....	45,000
Number of Catalan forges, making blooms direct from the ore, Jan. 1st, 1875.....	39
Annual capacity in blooms and billets, net tons.....	59,450
Number of bloomeries, Jan. 1st, 1875, making blooms or pig iron.....	49
Annual capacity in blooms, net tons.....	60,200

New Cask Making Machinery.

An invention, the result of which may hereafter have a very serious effect on the skilled labor market in certain departments of trade, was recently exhibited at the works of Messrs. Ransome & Co., sawmill engineers, King's road, Chelsea, Eng. The invention referred to is a series of improved machines, about a score in number, constructed for making casks for beer and hogsheds for wine. The great merits of Messrs. Ransome's patent are not only an improvement upon former patents which they have pressed into their service, but the combination of their own inventions with those of previous date, and the formation of the whole into one general system.

Practical illustration was given that casks for holding liquids of all kinds can be produced entirely without the aid of the skilled cooper at less than half the cost for labor, and when it is stated that one machine alone, worked by a lad, will joint in the most perfect manner six staves in a minute, while another will turn, bevel and oval a head with mathematical accuracy in less than that space of time, the great economy is at once apparent. Apart from the utility of the invention, or combination of inventions, it is a true artistic treat to witness the working of this massive clockwork machinery, and visitors were loud in their admiration of a most interesting and, indeed, educating exhibition.—*Iron.*

The Length of Rails.

We have made several allusions to the feat of the Edgar Thomson steel company in making rails of the previously unheard-of length of 60 feet. That new company signalized the starting of its works by the accomplishment of this extraordinary production. The feat was a matter of no little interest to iron masters and railroad men generally, and seems to have been accepted by our English cousins as a challenge of ability to produce long rails. And now we are informed that a manufacturer in England has produced a rail over 100 feet in length; nearly doubling the boasted feat of the Edgar Thomson company. No doubt we shall soon hear that the American company has produced rails over 100 feet in length, as Americans never like to be outdone in such matters, especially where they take the initiative.

But what is the use of such rails? Are they of any superior economic value to the common 30 foot rail? It is now very generally affirmed that the longer the rail the better, because there is less loss in cropping the ends to make a square joint, less expense in handling (within a reasonable length), and what is still more important, long rails require less joints to the mile of track, and thereby save the pounding and hammering so wearing to rolling stock and so unpleasant to the passenger. Nearly all writers upon the subject seem to agree that long rails are conducive to both economy and safety. Indeed, we have noticed but a single exception, and that in case, an intelligent correspondent of the *American Manufacturer*, who advances some most potent reasons for adhering to the 30 foot rail, which we will briefly refer to and condense under the following head:

How do Rails Become Dangerous?

In the manufacture of rails from the ingot by passing the iron between the rolls, the flange is drawn much thinner than the head, so that when the rail has left the rolls the flange cools so much more rapidly than the head that the rail, by the time it becomes cold, is curved into the form of a segment of a circle, with the flange on the outside. To obviate this difficulty it is usual to bend the rail as it drops from the rolls into the opposite direction, so that when it cools it will become straight. Manifestly this can be only imperfectly accomplished, especially with a very long rail, and hence the final work must be done by "cold straightening."

Now the physical construction of iron is not absolutely solid. It is, in fact, composed of particles which adhere by cohesion, induced by impact. The particles are thus imperfectly joined at best. Their cohesion, moreover, it is well understood, is less in proportion as the temperature of the iron is increased, hence hot iron may be easily bent, while cold iron is very rigid, and hence, furthermore, any disturbance of the particles of iron when cold, works a greater injury to their adhesive power or strength than the same degree of disturbance when hot.

For this reason cold straightening is more injurious to a rail than straightening when hot; therefore that method should never be resorted to when it can be avoided. Moreover, injury to rails by cold straightening cannot be detected by the usual inspection or tests, but the defects which inevitably follow such a process must exist to the detriment of the rail, and, in an unknown degree, to the danger of the passenger. It is well known that "broken rails" usually occur from damage originally caused by cold straightening. Hence, the proper length of a rail is the limit at which a rail can be drawn without the need of any serious straightening after it becomes cold. That limit, it is said, is 30 feet; while 100, or even 60 feet, unavoidably produce curves which require such a large amount of cold straightening as to render the rail very unsafe for use. The writer concludes his article as follows:

"I claim that 60 or 100 foot rails cannot be hot straightened perfectly. Secondly, that cold straightening is injurious to the physical structure of the metal. Third, that a higher per cent. of perfect rails can be made at 30 than 60 or 100 feet. Fourth, that 30 foot rails can be handled, shipped and put into position at less cost than 60 or 100 foot rails. Fifth, that the rail joints can be made as serviceable and as safe as any other part of the track. Consequently the innovation proposed of 60 or 100 foot rails will add to the expense of the rails, and at the same time surely tend to increase their defects without a single redeeming compensation."

"WHAT IS STEEL?" seems to be an unanswerable conundrum just now among metallurgists. Sir Joseph Whitworth proposes the following: "With so many rival and unsatisfactory definitions of steel, the writer would do away with all the different names by which various kinds of steel are known, such as blister, shear, double shear, common steel, spindle steel, silver steel, cast steel, etc., which carry no precise definite meaning; and would express what is wanted to be known by two numbers which should represent tensile strength and ductility."

POMPEO ENGINE FOR THE WATER WORKS AT HULL, ENGLAND.—A new Cornish pumping engine was started at the above named place on the 28th of December, 1875. This engine is one of the largest of the kind yet constructed, having a 90-inch cylinder, with a stroke of 11 feet, and presents, especially in the pumping arrangements, several peculiarities. The *Engineer* (London) promises illustrations of the machine at an early impression, merely making the chronicle of the start with the statement that it was in every respect successful.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	1 W'to Mar. 9.		1 W'to Mar. 16.		1 W'to Mar. 23.		1 W'to Mar. 30.	
	H.	L.	H.	L.	H.	L.	H.	L.
Adams Hill.	58	35	43	40	45	45	62	54
Alpha.	75	39	44	43	37	33	2	1
Amer'n Flat.	2	1	2	2	2	2	2	1
Andes.	54	41	43	3	4	4	4	3
Amazon.	1	1	1	1	1	1	1	1
Balm'n Con	1	4	3	4	4	3	4	3
Belcher.	41	38	56	33	33	34	35	3
Best & Bel.	61	62	62	58	62	57	63	58
Buckeye.	67	65	50	50	52	52	61	58
Bullion.	63	65	67	60	72	64	65	65
California.	97	89	80	88	90	87	91	82
Challenge.	125	116	120	113	127	117	125	115
Confidence.	25	23	27	26	28	26	28	26
Con Virginia.	458	433	438	415	90	85	289	289
Crown Point.	28	23	26	24	23	24	26	24
Cos Con.	350	500	550	37	400	20	37	100
Day.	9	8	8	7	7	7	7	7
Dayton.	9	8	8	7	7	7	7	7
Eclipse.	8	9	8	7	9	8	10	9
Empire Mill.	18	8	8	7	11	8	11	10
Eureka (G V).	1	1	1	1	1	1	1	1
Fureka Con.	1	1	1	1	1	1	1	1
General.	62	62	62	62	62	62	62	62
Europa.	62	62	62	62	62	62	62	62
Gila.	1	1	1	1	1	1	1	1
Globe Con.	2	2	2	2	2	2	2	2
Gold & Car.	24	22	22	21	22	20	23	21
Hale & Nor.	50	46	50	54	65	62	75	66
Ida Ellmore.	20	12	15	13	18	15	15	14
Jefferson.	4	3	3	2	4	3	4	3
Julia.	17	16	17	16	18	16	19	16
Justice.	29	26	27	26	27	26	33	26
Kaiser.	20	2	2	2	2	2	2	2
K & K.	2	1	1	1	2	1	2	1
Kentuck.	5	16	13	16	20	16	20	17
Kinkier/Kr.	5	4	5	4	4	3	4	4
Krusel V.	4	4	4	2	2	3	3	2
Lady Brian.	4	3	4	3	4	3	4	3
Lady Wash.	4	4	4	3	4	3	4	3
Leo.	1	87	1	1	1	1	1	1
Leviathan.	1	1	1	1	1	1	1	1
Mahony.	0	40	40	40	40	40	40	40
Maneheld.	50	2	3	3	3	2	3	2
Marion V.	45	30	39	32	33	34	42	33
Midea.	8	70	750	500	750	600	750	600
Mint.	8	70	750	500	750	600	750	600
Newark.	2	2	2	2	2	2	2	2
New York.	2	2	2	2	2	2	2	2
Niagara.	35	35	37	36	41	37	40	40
North Belle.	75	5	1	37	80	62	6	6
New Coso.	5	4	5	4	5	4	5	4
Occidental.	17	63	72	61	67	64	74	65
Opin.	8	70	750	500	750	600	750	600
Overman Hill.	8	70	750	500	750	600	750	600
Overman.	8	70	750	500	750	600	750	600
Pacific.	1	1	1	1	1	1	1	1
Phil Sheridan.	1	1	1	1	1	1	1	1
Poorman.	50	37	50	2	1	750	500	750
Prepest.	6	3	7	5	6	4	7	6
Prussian.	21	18	17	17	1	1	18	17
Rock Island.	4	4	4	4	4	4	4	4
Rex Patch.	1	1	1	1	87	80	18	18
Save.	17	1	1	15	18	18	22	18
Savannah.	91	80	88	88	88	88	88	88
Sierra Nevada.	28	22	25	22	25	23	24	24
Silver Hill.	12	11	11	10	10	10	11	10
St. Charlott.	28	20	40	20	35	16	50	30
Sugarc.	19	19	19	19	19	19	20	18
Un'on C. N.	19	17	18	15	21	16	34	24
Utah.	70	50	68	40	60	40	80	45
W. B. Fargo	19	19	19	19	19	19	19	19
W. Ind'y.	19	19	19	19	19	19	19	19

Sales at S. F. Stock Exchange.

FRIDAY, A., March 24.	200	Publ Sheridan.	14
370 Alpha.	54	200 Pacific.	14
191 Beet & Holcher.	54	100 Ray & Ely.	17
200 Buckeye.	54	100 Rock Island.	17
225 Celer.	54	370 St. Louis.	17
75 Fullon.	54	150 S. Charlot.	17
1890 Con Virginia.	86	50 S Justice.	24
6 California.	97	50 Galadonia.	24
45 Joint.	97	7 Tybo.	10
45 Comdenche.	97	50 Troian.	10
2835 Caledonia.	148	45 Utah.	24
200 do.	148	100 Woodville.	34
210 do.	148	250 Wells-Fargo.	45
50 Dancy.	148		
810 Exchequer.	22	14	TURDAY, A. M. Mar. 25.
2890 Empire Mill.	10	575 Alpha.	52
100 Hale & Curry.	21	375 Best & Bel.	50
300 Hale & Curry.	21	100 B. & B.	5
2875 Imperial.	17	915 B. & B.	5
50 do.	10	230 Bulhon.	5
775 Julia.	16	400 Buckeye.	5
2130 Justice.	33	100 Con Virginia.	87
100 do.	5	100 do.	5
400 Kennec.	18	100 do.	5
50 do.	18	385 Condenche.	40
1503 Lady Bryan.	36	500 California.	88
700 Mexican.	38	175 Caledonia.	14
50 do.	38	100 do.	5
500 do.	38	225 Coblar.	135
700 Philr.	66	200 Crown Point.	24
51 Overman.	84	50 do.	5
250 Pargo.	15	100 do.	5
100 do.	15	100 Empire Mill.	10
750 Sierra Nevada.	21	45 Exchequer.	22
15 do.	5	50 do.	5
15 do.	5	50 do.	5
243 Union.	37	50 Hale & Curry.	5
360 Yellow Jacket.	37	50 Hill.	5
50 do.	37	20 Gold Hill.	54

AFTERNOON SESSION.	205 Hale & Nor.....7
40 Am Flat	935 Imperial.....17½@17½

110	Alpe.	.....	40	Just co.	.....
50	Avoance.	..... 10% @ 10%	40	do.	..... b 30 1/2
200	Alta.	.....	40	do.	..... b 30 1/2
80	Ardes.	..... 40 1/2	330	Julia.	..... 18 1/2 @ 18 1/2
100	do.	..... 50 1/2	100	do.	..... b 5 1/2
25	Be mont.	..... 50 1/2	100	do.	..... b 5 1/2
495	Baltimore Com.	..... 3 1/2 @ 3 1/2	180	Lady Bryan.	..... 2 1/2 @ 2 1/2
50	do.	..... 5 1/2 3/4	100	do.	..... e 10 1/2
100	do.	..... 5 1/2 3/4	400	Mexican.	..... 4 1/2 @ 4 1/2
700	Oso Con.	..... 3 1/2 @ 3 1/2	180	Opbir.	..... 20 1/2 @ 20 1/2
1335	Challenge.	..... 7 1/2 @ 7 1/2	180	Opbir.	..... b 30 1/2
225	Dardanille.	..... 3 1/2 @ 3 1/2	300	Overman.	..... 5 1/2 @ 5 1/2
100	do.	..... 3 1/2 @ 3 1/2	50	Seg Belcher.	..... 40 @ 40 1/2
125	Kurek Con.	..... 10 1/2 @ 10 1/2	50	do.	..... b 3 1/2
60	Eie Con.	..... 10 1/2 @ 10 1/2	50	do.	..... b 3 1/2
215	Propa.	..... 10 1/2 @ 10 1/2	300	Sierra Nevada.	..... 28 @ 28 1/2
25	Propa.	..... 50 @ 50	250	do.	..... b 10 1/2
20	Globe Charit.	..... 10 1/2 @ 10 1/2	250	do.	..... b 10 1/2
90	Globe Charit.	..... 10 1/2 @ 10 1/2	250	do.	..... b 10 1/2
60	G Thomas.	..... 5 1/2 @ 5 1/2	250	Union Con.	..... 19 1/2 @ 19 1/2
1220	Gila.	..... 2 1/2 @ 2 1/2	150	do.	..... b 5 1/2
120	do.	..... 7 1/2 @ 7 1/2	1700	Yellow Jacket.	..... 40 @ 40 1/2
475	Jefferson.	..... 3 1/2 @ 3 1/2	50	do.	..... e 30 1/2
220	Jackson.	..... 2 1/2 @ 2 1/2	50	do.	..... e 30 1/2
700	Kosuth.	..... 3 1/2 @ 3 1/2	50	do.	..... e 30 1/2
220	do.	..... 4 1/2 @ 4 1/2	50	do.	..... e 30 1/2
50	Lady Wash.	..... 4 1/2 @ 4 1/2	MONDAY A. M., MARCH 27		
1350	Leopard.	..... 5 1/2 @ 5 1/2	430	Alpha.	..... 5 1/2 @ 5 1/2
100	Lee.	..... 2 1/2	300	Best & Belcher.	..... 5 1/2 @ 5 1/2
1450	Manhattan.	..... 1 1/2 @ 1 1/2	50	Belcher.	..... 35 1/2 @ 35 1/2
200	Manhattan.	..... 1 1/2 @ 1 1/2	15	Bullion.	..... 50 @ 50
30	Mansfield.	..... 40	100	do.	..... b 10 1/2
360	Meadow Valley.	..... 2 1/2	175	Chollar.	..... 13 1/2 @ 13 1/2
100	Mint.	..... 5 1/2	10	do.	..... b 10 1/2
100	New Coso.	..... 62 1/2 @ 62 1/2	1045	Confidence.	..... 23 1/2 @ 23 1/2
655	N Con Va.	..... 1 1/2 @ 1 1/2	100	do.	..... 23 1/2 @ 23 1/2
655	New York.	..... 2 1/2 @ 2 1/2	1160	California.	..... 5 1/2 @ 5 1/2
100	do.	..... 30 @ 30	50	do.	..... b 10 1/2
20	North Belle.	..... 4 1/2 @ 4 1/2	905	Con Virginia.	..... 5 1/2 @ 5 1/2
205	Occidental.	..... 1 1/2 @ 1 1/2	725	Grove.	..... 10 @ 10 1/2
480	Poolman.	..... 50 @ 50	3655	Caledonia.	..... 1 1/2 @ 1 1/2
325	Pearl.	..... 2 1/2 @ 2 1/2	100	Con Gold Hill.	..... 10 @ 10
200	Prosper.	..... 2 1/2 @ 2 1/2	545	Daney.	..... 5 1/2 @ 5 1/2

1915	Empire Mtn.....	2.16	0114	400	Europa.....	62.50
1680	Esquequer.....	246.25	250	300	Florida.....	2.00
1323	Gould & Curry.....	21.00	215	2.0	G. Thomas.....	2.50
100	do.....	30.00	218	4.5	Gila.....	22.50
1430	Imperial.....	17.50	0114	500	Golden Chariot.....	2.25
100	Justice.....	2.15	032	100	Hussey.....	27.50
2260	Julia.....	156.00	17	230	Jelerson.....	40.50
100	Jack & Co.....	1.00	20	20	Knickerbocker.....	4.00
164	Billy Bryan.....	2.15	021	245	Koeshut.....	34.00
309	do.....	s.10	225	30	Lopod.....	10.00
230	Mexican.....	38.25	120	120	Lovely.....	15.00
615	do.....	3.00	120	150	Lady Wash.....	2.00
345	Ophir.....	b.5	720	170	Meadow Valley.....	2.25
1915	Overman.....	82.00	66	700	Mansfield.....	40.00
202	do.....	7.00	215	400	Morning Star.....	10.15
202	do Nevada.....	7.00	215	400	Northern Belle.....	40.00
295	Savage.....	18.50	0115	400	do.....	40.00
100	do.....	b.10	215	650	N. York.....	7.25
100	Sue.....	b.10	1.15	1385	N. Con Virginia.....	1.00
31	Seg Belcher.....	s.09	1	900	occidental.....	5.00
10	do.....	b.5	30	100	Prospect.....	7.00
1915	Yellow Jacket.....	38.00	33	100	do.....	b.30
65	do.....	b.15	39			

AFTERNOON SESSION.		150 Phil Sheridan.....12@12
20 Advance	103	500 Pacifico.....1
		175 Box & E.....18@18

175	Advance	40@14	685	Rock Island	70@14
176	Alta	4 1/2@14	690	South Caroli.	50@20
177	Am Flat	30@14	695	South Justice	20@34
178	Ans	50@14	696	St. Louis	10@10
179	California Con.	4@13	699	Silver Hill	10@10
180	Isaon	9@14	1745	Sec Caledonia	1@14
181	Belmont	1@14	150	Tybo	10@14
182	Belmont	1@14	151	Tybo	11@14
183	Boz	10@14	152	Utah	10@14
184	Cozmopolitan	37@14	1060	Utah	10@14
185	Chaffee	8@14	1061	do	b 5 @ 2
186	Darton	10@14	1062	Wian	10@14
187	Dayton	10@14	160	Waverville	34@14
188	Dayton	10@14	160	do	b 30 @ 3
189	Eureka Con.	12@10	1745	Wells-Fargo	83@20
190	Elclipse	50@10	1745	Wells-Fargo	83@20
191	Gen Thomas	5@14		Belcher	
192	Globe	37@6			
193	Globe	37@6			
194	Globe	37@6			
195	Jefferson	50@14			
196	Jackson	4@14			
197	Knicker	4@14			
198	Leviathan	34@14			
199	Leopard	4@14			
200	Lady Wash	2@14			
201	Lee	2@14			
202	Leviathan	34@14			
5	U do	b 30 @ 1			
35	Meadow Val.	2@14			
36	Meadow Val.	2@14			
100	Morning Star	2@14			
105	North Belle	1@10			
685	New York	2@14			
686	New York	2@14			
250	North Con Vir.	1 1/2@10			
600	Occidental	50@14			
430	Panther	4@14			
431	Panther	4@14			
340	Prospect	1@14			
145	Roy & Ely	15@10			
1700	Rock Island	70@14			
500	St. Louis	10@10			
500	St. Justice	3@20			
335	Silver Hill	11@10			
200	St. Otr	10@14			
600	Trojan	1@10			
680	Uran	3@13			
450	Woodville	3@12			
450	Wells-Fargo	60@20			

TUESDAY, A. M., MARCH 28

89	Bel & Belchr.	50 @ 1 1/2	630	Valley Road	36 @ 3 3/4
93	Belchr.	35 @ 3 3/4	AFTERNOON SESSION.		
95	Bullion	62 @ 6 1/2	25	Am Fladv.	10 @ 1 1/2
920	Virginia	35 @ 1 1/2	50	Am Fladv.	10 @ 1 1/2
55	Bolton	18 @ 1 1/2	50	Alta.	10 @ 1 1/2
70	Confidence	28 @ 2 1/2	115	Am Flat	1 1/2 @ 1 1/2
13	Crown Point	24 @ 4 3/4	135	Als	4 @ 1 1/2
19	California	25 @ 5 1/2	20	Brook	2 @ 1 1/2
29	do	b 30 1 1/2	20	Brook	2 @ 1 1/2
29	Caledonia	14 @ 4 1/4	115	Belmont	1 1/2 @ 1 1/2
30	do	b 30 1 1/2	110	Baltimore Con.	3 @ 1 1/2
7	D'ney	2 @ 3 1/2	150	Bismopolitan	5 @ 1 1/2
3	Emancipator	11 @ 1 1/2	150	Bolton	5 @ 1 1/2
250	Empire Mill	11 @ 1 1/2	150	Campanian	2 @ 1 1/2
750	Gould & Curry	2 @ 1 1/2	50	do	5 @ 1 1/2
100	do & Nor.	17 @ 2 1/2	50	do	5 @ 1 1/2
100	Impet	17 @ 2 1/2	200	Dardanelles	3 @ 1 1/2
330	do	b 10 1 1/2	200	Dardanelles	3 @ 1 1/2
530	do	b 10 1 1/2	100	Eurelia Con.	12 @ 1 1/2
30	Julia	19 @ 1 1/2	325	Gharior	2 1/2 @ 1 1/2
15	do	b 30 1 1/2	105	Gen Thosae	@ 1 1/2
55	Justice	31 @ 3 1/2	50	Gibbs	@ 1 1/2
3	Kentucky	1 @ 1 1/2	300	do	5 @ 30 1 1/2
125	do	b 30 1 1/2	35	Jeff-ron	4 @ 3 1/2
18	Lady Bryan	2 @ 2 1/2	50	Jason	1 @ 1 1/2
210	Mexican	39 @ 4 1/2	170	Julia	17 @ 1 1/2
270	do	39 @ 4 1/2	100	Knickerbocker	4 @ 4 1/2
535	Overman	8 @ 3 1/2	185	Kosuth	3 @ 4 1/2
1530	do	73 @ 1 1/2	100	Leopard	4 @ 4 1/2
30	Phoebe	1 @ 1 1/2	450	Levathan	1 1/2 @ 1 1/2
50	eg Belchr.	90 @ 9	600	do	5 @ 1 1/2
300	Savage	22 @ 2 1/2	100	Meadow Valley	4 @ 2 1/2
50	do	5 @ 2 1/2	50	Mint	6 @ 1 1/2
23	do	2 @ 10 1 1/2	20	Morning Star	1 @ 1 1/2
700	do	e 20 2 1/2	330	New York	13 @ 1 1/2
270	Sierra Nevada	2 @ 2 1/2	545	Nth Con Va	1 1/2 @ 1 1/2
100	do	b 10 1 1/2	50	N Carson	5 @ 1 1/2
50	do	b 10 1 1/2	20	Nathan	5 @ 1 1/2
85	Succor	1 @ 3 1/2	280	Panther	5 @ 1 1/2
2510	Union	18 @ 1 1/2			
100	do	b 10 1 1/2			
23	do	b 10 1 1/2			
4150	Yellow Jacket	36 @ 3 3/4			
	do	5 @ 3 1/2			

1000 Andes.....	33½@4	2151 Pacific.....	1
		395 Prospect.....	6½@4

350	Alps	14	42	15	Ray & Ely	16	61
355	Alpine	14	42	15	Rock Island	16	61
360	Am. Pac.	14	42	15	St. Louis	16	61
365	Am. Pac.	14	42	15	St. Louis	16	61
370	Am. Pac.	14	42	15	St. Louis	16	61
375	Amazon	14	42	15	Silver Hill	16	61
380	Bacon	14	42	15	South Chariot	50	30
385	Bacon	14	42	15	South Chariot	50	30
390	Brooks	14	42	15	Silver City	16	61
395	Bolmont	14	42	15	Sullivan	16	61
400	Coe Con	14	42	15	Trojan	16	61
405	Challenger	14	42	15	Trojan	16	61
410	Cosmopolitan	14	42	15	Vivian	16	61
415	Dayton	14	42	15	Woodville	24	61
420	Dananelle	14	42	15	West Fargo	63	61
425	Eureka Con	12	42	15	West Belcher	3	61

SALES OF LAST WEEK AND THIS COMPARED.

THURSDAY A. M., MAR. 23		THURSDAY A. M., MAR. 30	
910 Alpha.....	5.04	955 Alpha.....	6.00
90 Belcher.....	5.34	935 Belcher.....	3.40
90 Belcher.....	37.88	935 Do.....	5.34
930 Belcher.....	5.34	935 Do.....	5.34
50 Bullion.....	5.32	25 Do.....	5.30
182 Buckeye.....	1.12	123 Bullion.....	5.00
1350 Crown Point.....	25.25	1270 Caladema.....	12.25
50 Do.....	5.30	50 Do.....	5.30
750 California.....	67.88	50 Conf. Nce.....	2.25
50 Do.....	5.35	815 Con Virginia.....	55.25
530 Choliar.....	12.25	235 Crown Point.....	2.25
50 Do.....	5.30	350 Do.....	5.30
20 Do.....	5.35	350 California.....	50.25
50 Do.....	5.30	375 Choliar.....	12.25
555 Confidence.....	2.25	50 Co Gold Hill.....	5.30
50 Do.....	5.30	1383 Exchequer.....	7.15
435 Caladema.....	11.25	215 Empire.....	5.30
140 Dasey.....	1.00	215 Empire Mill.....	2.25
350 Empire M.....	4.25	50 Curry.....	2.25
555 Exchequer.....	7.15	57 Hale.....	2.25
50 Do.....	5.30	1555 Imperial.....	16.00
955 Gold & Curry.....	21.00	1035 Justice.....	28.25
100 Hale & Norcross.....	6.00	959 Julia.....	16.50
225 Imperial.....	16.00	100 Do.....	5.30
100 Do.....	5.30	100 Kentuck.....	17.50
100 Justice.....	27.00	50 Do.....	5.30
1674 Julia.....	17.50	130 L. Do Bryan.....	21.00
500 Kentuck.....	20.00	100 Mexican.....	5.30
50 Do.....	5.30	25 Do.....	5.30
750 L. Do Bryan.....	21.00	100 Do.....	5.30
210 Mexican.....	3.00	4035 Ophir.....	72.00
340 Do.....	5.35	50 Do.....	5.30
150 Do.....	5.35	50 Do.....	5.30
50 Do.....	5.35	515 Overman.....	31.00
50 Do.....	5.35	350 Sierra Nevada.....	2.25
1065 Succor.....	83.00	50 Do.....	5.30
50 Sierra Nevada.....	23.25	50 Do.....	5.30
25 Do.....	5.30	100 Succor.....	83.00
1535 Union.....	14.00	1120 Union Con.....	18.00

AFTERNOON SESSION. | AFTERNOON SESSION.

100 Advance.....	10½	345 Alps.....	3¾@3½
230 Alps.....	4¾@4½	120 Advance.....	11½@11¾

440 Belmont	1%	215 Amazon	1% @
440 Balt Con	1%	215 Ames	1%
390 Coco Con	30% @ 35c	100 Cose Con	32% @ 35c
390 Cose Con	30% @ 35c	100 Cose Con	32% @ 35c
200 DeRea	1%	40 DeRance	2%
130 Eureka Con	1%	320 Dayton	14% @ 75c
530 Gila	3% @ 35c	260 Daneland	3%
530 Golden Chariot	2% @ 35c	300 Daneland	3%
300 G Thomas	5%	300 Florida	1%
190 Globe	40% @ 35c	420 Gila	2% @ 35c
270 Jefferson	3% @ 35c	300 Golden Chariot	2% @ 35c
240 Knicker	4% @ 35c	1120 G Thomas	5% @ 35c
50 Meadow Valley	2% @ 35c	300 Jackson	5%
50 Metalic	2%	50 Jefferson	3%
10 Northern Belle	40%	150 Kousuth	3%
300 Panther	1%	155 Leonard	1% @ 35c
300 Raymont	1%	165 Ladr Wash	4% @ 35c
130 Raymond & Ely	17% @ 35c	165 Meadow Valley	2%
480 Silver Hill	10% @ 35c	300 Manhattan	5%
125 T Parick	10%	100 Maryland	5%
550 Utah	21% @ 35c		

400	New York.....	1 3/4 @ 1 1/2
430	North Carson.....	60c

865	Occidental.....	5½¢@
130	Pan'her.....	13
250	Phil Sheridan.....	7½@14
70	Prospect.....	75
200	Poorman.....	75
660	Ray & Ely.....	1901½
2300	Rock Island.....	14½@20
500	S Justice.....	17 8¢
2350	Sex Caledonia.....	1½@2
35	~ Hill.....	10½
8110	Silver City.....	14
175	South Obior.....	20
50	Tybo.....	12
300	Trojan.....	1½@16
945	Woodville.....	2½@24
1600	Wells Fargo.....	80-50
200	West Belcher.....	2

2.1 D 12 2.1 D 1

SATURDAY, A. M., MAR. 25.		Rock Island.	
50	Albion.	225	Savage.
50	Albion.	225	Savage.
100	Andes.	50	S Nevada.
65	do.	100	do.
220	Andes.	100	do.
135	Res. & Bel.	500	Union.
85	Belcher.	100	do.
20	do.	90	do.
40	Butler.	500	W Belcher.
225	Balt Cons.	100	Wells Fargo.
10	do.	885	Yellow Jacket.
50	California.	100	do.
10	do.	100	do.
40	Con Virginia.	100	do.

130 Crown Point...26 $\frac{7}{8}$ + 25 $\frac{1}{4}$ AFTERNOON SESSION.

90	do	b 10. 26%	170	Alps	45.00%	
100	Dardanel.		600	Brooks		
100	Erie		50	Bullion	6.66%	
20	do	b 10. 1.1%	250	do	Boston	50.00%
10	Empire Mil.		40	Coso Con.	40.42%	
20	Excquer	23.62%	275	Crown Point	25. 2%	
50	do	b 30. 21%	100	Caledonia	30. 15%	
50	do	b 30. 21%	50	do	5. 15%	
50	do	b 5. 17%	50	do	5. 15%	
10	Globe	b 5. 17%	20	California	59%	
10	Great Curry	b 10. 2.2%	1050	Erie Con.	16.1 24%	
80	do	b 30. 22%	455	Fureka Con.	12.01%	
10	Hale & Norcross		10	Empire Mil.		
50	do	b 5. 17%	400	Forest	2. 2%	
50	do	b 5. 17%	5	Gold	5.00%	
220	Julia	4.01%	5	Geo Thomas	5.00%	
50	do	b 30. 17%	150	Gold Run	7. 7%	
50	do	b 30. 17%	150	Gold Bar	5.00%	
50	do	b 30. 17%	200	Imperial	16. 18%	
70	do	b 30. 17%	210	Jefferson		
25	Justice	b 10. 3.3%	50	Juelite	5. 4%	
40	do	b 5. 3.4%	655	Mad Bryan	6. 6%	
40	do	b 10. 3.3%	55	Leoparo	6. 6%	
120	Kentuck.	20.00%	90	Meaujou Valley	2. 2%	
20	do	b 10. 3.3%	335	Mexican	39.00%	
250	Levinthal	4.01%	270	New Virginia	2. 2%	
210	Les	2. 2%	20	New York	2. 2%	
150	Lady Bryan	2. 2%	110	Ocidental		
350	Mexican	40.00%	14	Opfr.	27. 12%	
50	do	b 5. 4.1%	100	Park	10. 10%	
150	do	b 5. 4.1%	250	Panber		
50	do	b 5. 4.1%	40	Raymond & Nev.		
120	do	b 5. 4.1%	20	Sierra Nevada		
120	do	b 5. 4.1%	30	do	18.18%	

14:00 Opb r.....	.72½@14	6:0 Yellow Jacket.4.2½@43½
50 ..do.	b 5 74	TUESDAY - M. MARCH 26

[illegible]

MONDAY, A. M., MARCH 27.

[illegible]

19	Belcher	30	do.	30	174
15	Baltimore	35	do.	b 30	181
20	Beet & Belcher	64	do.		19
20	Belcher Point	22	do.	b 30	19
20	Camden	25	do.		
200	City of Boston	24	do.	1	20
15	Dayton	11	do.	500	14
20	Deer Creek	11	do.	500	24
20	Eroheque	25	do.	940	10
340	Erie Con.	1.10	do.	300	12
50	Forrest	4	do.	300	5
20	Gold Run	74	do.	605	72
40	Golden Chariot	2.02	do.	10	72
85	Jefferson	3.4	do.	40	74
80	Justice	30	do.	10	70
40	Julia	35	do.	150	6
275	Meadow Valley	2.4	do.	275	12
250	Manfield	4.20	do.	100	26
100	Maricopa	4	do.	220	21
100	New Coso	60	do.	69	20
70	Prussian	24	do.	100	2
10	Prospect	30	do.	50	2
125	Out Charlot.	8	do.	50	21
965	Saville	2.30	do.	200	550
20	Utah	20	do.	200	14
425	Yellow Jacket	3.67	do.	250	350
250	do.	5.37	do.	500	340
			do.	b 10	350

FRIDAY, A. M., MARCH 24.	20 Alps.....
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[illegible]

490 Leviathan.....1⁵/₈ THURSDAY, A. M., MAR. 30
688 Lady Bryan.. ..3²/₈

[illegible]

450	1st BACKS.....	35/2@35.4	24	do.....	b 5..18
AFTERNOON SESSION.			120	do.....	b 3..18

250 Belmont	1%	100	do	b 30	154
350 Coco Coconino	37 1/2@	30	Justice	25	202
300 City of Tucson	1%	30	Justice	25	202
300 Cn Virginia	1%	50	do	b 5	1
50 Confidence	25@30	10	do	b 10	17
100 City of Coconino	1%	10	do	b 3	2
175 Empire Mill	1%	10	do	b 10	1
300 Erie Con.	1%	520	Lady Bryan	23	2
100 Forrest	1%	100	do	b 30	25
1000 Gila	134@	100	do	b 30	25
30 Gould & Curry 214@	1%	120	M. do.	b 5	4
615 Gila	23@22	50	do	b 10	41
849 Jackson	35@31 1/2	50	do	b 10	11
1600 Justice	35@31 1/2	30	do	b 3	3
225 Julia	164@	665	Cuphr.	72 1/2	4
100 do	b 10	200	do	b 10	12
1000 L. Coconino	164@	60	do	b 10	12
30 Jefferson	1%	20	do	b 14	13
100 Lady Washington	3%	100	do	b 10	73
585 Leopold	6@34 1/2	50	do	b 5	9
300 Matamoras	1%	120	Rose Island	b 5	9
100 do	b 30	150	do	b 30	4
200 Mansfield	350	400	do	b 30	4
3000 Maricopa	1%	225	Savage	20	4
321 "nther	134@	150	do	b 30	4
20 Poorman	81 1/2@350	150	do	b 30	20
105 Rock Island	1%	31	do	b 30	21
3000 San Carlos	1%	10	do	b 30	21
335 Union	134 1/2	10	do	b 30	21
30 do	b 10	120	Sierra Nevada	25	20
30 do	b 5	25	Valley	40	16
50 do	b 5	30	do	b 30	16
50 do	b 3	30	do	b 30	16

500 Wells Fargo.....50@55c

29	do.	do.	32	Alps	33
30	do.	do.	33	Caledonia	124
31	do.	do.	34	Oso Con	334
130	do.	do.	35	Osmop Lion	334
			36	do.	334
			10	Exchequer	2
			109	Forrest	2
			180	Gla	124
			20	do.	2
			20	Gould & Curry	234
			100	Gold Bar	2
			80	Golden Chariot	2
			100	Gold Run	2
			100	do.	134
			10	Hale & Nororose	1
			80	Imperial	18
			110	Jefferson	38
			100	do.	38
			120	do.	53
			50	Jalla	167
			30	do.	510
			115	Leonard	2
			100	do.	53
			100	do.	53
			300	Leviash n.	10
			200	Mansfield	10
			100	do.	10
			170	do.	514
			10	do.	514
			180	Occidental	53
			50	do.	30
			43	Fault r.	1
			240	Poorman	18
			76	Ray & Co.	18
			20	Rock Island	18
			50	South Chariot	18
			653	Wells Fargo	18
			240	Yellow Jacket	18
			5.0	do.	374

JOSEPH CUNRO, while engaged in wheeling a barrow full of refuse rock, at Volcano, last week, found in the lot a large piece of quartz which was full of pieces of gold, making the whole specimen worth from \$500 to \$1,000 in gold.

THE rainfall at Shasta this season amounts to 85.02 inches. Shasta is about the wettest place in the State, the amount registered in one year being over 90 inches.

ALL the mills on the Carson river are running to their full capacity, with plenty of water and plenty of ore on hand.

DAYTON.—Gold Hill News, March 23: Sluicing the main shaft is making rapid progress, the bottom in good working ground. The station set for the 700-ft level has just been completed. The north and south drifts on the 600-ft level are each pressed steadily ahead, running parallel with the ore vein. These drifts are

gradually laying bare a large portion of the ledge ready for cross-cutting, and it is reasonable to expect some lively ore developments on that level soon. The north drift a day or two since tapped a considerable stream of water, but which has not yet given any trouble whatever.

BULLION.—Sinking the main incline has been resumed and is making excellent headway. The north drift on the 1400-ft level has been cleaned out and repaired for a distance of 256 feet. The up-ramp from the 1700-ft level is steadily advancing, the face in fine working ground. The northeast drift on the 200-ft level of the Imperial shaft is being pushed ahead with all possible energy toward the ore vein, the face still in hard blasting rock. It will probably take 10 days or two weeks yet to reach the black dikes and heavy clay always found on that portion of the Comstock lying next to the ore vein.

SIERRA NEVADA.—Sinking the shaft below the 1500-ft level is making excellent progress. The main south drift, on the 1000-ft level, is steadily pushed ahead to connect with the winze now being sunk in the north drift on the 700-ft level of the old shaft.

VERMONT.—Sinking the shaft is going forward at a fair rate of speed. The main incline is being drilled out well, and the work being pushed with all possible energy. The superintendent, Mr. J. P. Hutchinson, has just returned from San Francisco, where he has contracted for steam hoisting machinery of a power sufficient to sink the shaft and prospect the mine to a depth of 1,200 feet or more. Preparations for the erection of this machinery, as soon as it arrives on the ground, are now being made, and it is expected that the mine will take but a very short time to have it set up and in good running order.

MEXICAN.—The course of the north drift, on the 1465-ft level, has been changed until the drift is skirting the east clay selvage of the ore vein, cutting occasional spools and streaks of ore. The drift will be continued in this way for some distance, and the ledge will be exposed in a more favorable position than the ore body determined. The ore where it was cross-cut farther back shows great richness, and taken altogether, is of a good milling character. The average assays are excellent, and there is not a doubt but a fine paying ore deposit is being opened.

CROWN POINT.—Daily yield, 350 tons of ore—keeping the mills steadily running. On the 1600-ft level a cross-cut has been run near the foot of the south winze No. 2, penetrating the ledge for some distance, showing the ledge to be solid quartz and low grade ore. The main south drift, on the 1600-ft level, is steadily advancing toward the Belcher line. The east drift on the 1700-ft level has reached the wall of the ledge, finding only quartz and low grade ore in its course. A drift south has been started on this ore vein, which has not yet made any important developments.

IMPERIAL-EMPIRE.—The north drift on the 200-ft level is steadily advancing toward the Alpha ground, the face still in rich ore. The steady development of this body of ore is not only placing the Imperial once more in a fair way to join the ranks of our dividend paying mines, but is also leading to the almost inevitable conclusion that the Alpha will yet prove itself to contain a bonanza hardly second to that of the Consolidated Virginia mine.

CONSOLIDATED VIRGINIA.—Daily yield, 750 tons of ore, keeping the mills all crushing up to their full working capacity. The yield of bullion for the month of March is already upwards of \$2,000,000, and exceeds that of February by about \$400,000, at the same date. Providing all that no unavoidable circumstances happen to prevent, the production of the mine will for the month exceed \$3,000,000. These facts need no comment; they speak for themselves in language so forcible that to attempt to add a word would be folly. One wrong impression in regard to the mine that seems to have gained some credence, we desire to set right, and that is that this mine is being rapidly exhausted of its rich ores. Those who argue thus, forget three most important facts, the first of which is, that the mine is not yet in length, and on the 1500-ft level is almost all rich ore that needs no assorting, and contains no horse or patch of waste to amount to any consideration whatever. The second is, that instead of the ordinary, small and narrow stripe of ledge and streaks of ore usually found, this ore vein on the same level ranges from 250 to 300 feet in width, and that when a breast of that immense width is cut out, the waste will be so small, and the waste, or even poor ore to separate, the extraction of 750 tons of ore per day makes a most insignificant showing. The third is the fact that the mine has been prospected by means of winzes to a depth of 147 feet below the 1500-ft level, sufficiently to know that the ore not only extends downward to that depth, but that its quality is as rich and is almost, if not quite, as good as that of the first 147 feet. The ore is worked on the 1500-ft level. These facts insure as large a body of rich ore to extract from below the 1500-ft level, as there has been above, and taking into consideration the immense amount of rich ore yet above that point, it is literally impossible for the best mining experts to set a time for the exhaustion of the mine, laying aside all conjecture whatever in regard to what may be found in the depths below the 1500-ft and 1700-ft levels, and that none can tell until the miner's pick has solved the problem.

CALIFORNIA.—Sinking the O. & C. shaft has been impeded somewhat during the past few days by an unusual heavy flow of water. Day before yesterday the flow had increased to 24 inches, miners' measurement, which, although handled easily by the pump, was too strong to allow men to work at the bottom. Yesterday the water was again gradually on the decrease, and the men resumed work at the bottom on last evening. The winze being sunk in the cross-cut No. 6, on the 1500-ft level, has reached and connected with the north drift on the 1500-ft level, and is now being continued on downward to reach a point at which it is desired to connect with the Ophir mine on the 1465-ft level, for air purposes. The north drift on the 1400-ft level is being steadily pressed ahead, also to connect with the Ophir at that level. The California mill, with a crushing capacity of 300 tons per day, will be started on the ore from this mine on the first of the coming month. This will, of course, lessen to some extent the yield of the Consolidated Virginia for the month of April, but will add an increase, if anything, to the combined bullion production of the two mines.

HEXORLE.—Daily yield, 450 tons of ore. The ore breasts are both looking and yielding well, the ore continuing of a fine character, rich in gold. The mills are kept steadily running, and the bullion yield of the mine will not fall short of that of last month. The dumps are kept well supplied with ore, which is being shipped to the mills as fast as it is extracted. Sinking the air shaft below the 1500-ft level is going steadily ahead. The prospecting winze below the 1500-ft level are looking finely and promise a development of a body of good paying ore in that portion of the mine. The north drift on the same level is also showing well. The excavation for the new pumping machinery on the surface at the air shaft is going steadily forward. The erection of the new tar-house and vat to be heated by steam for tarring the hoisting cables is nearly completed.

GRIMM.—Daily yield, 150 tons of ore. The ore breasts on the 1500 and 1465-ft levels are looking splendid, and continue their regular supply of good milling ore. The drifts on the 1600-ft level have been cleaned out and repaired into the face of the ore breasts on that level, so that the extraction of ore at that point can be resumed whenever it is desirable or necessary to do so. The east shaft connecting with the 1700-ft level has been cleaned out and repaired to within a very short distance of the bottom. A drift south on the ore vein has been started on the 1100-ft level. The prospects at that point are quite favorable. The enlargement of the shaft is rapidly approaching completion. The mills are kept steadily crushing ore from the mine. The new office and assay rooms are rapidly approaching completion. The machinery is all working splendidly, and

the future again begins to look more hopeful and prosperous.

LADY BRYAN.—Sinking the shaft is making steady progress, the bottom in good sinking ground. South cross-cut No. 2, on the 330-ft level, is being pushed steadily ahead, the face in softer ground, with evident indications of a more favorable ledge formation ahead. The ore prospects on this level are growing more favorable as the work of development proceeds. The main south drift on this level is steadily advancing to the southward, without change of interest to note. The mill is running steadily on ore from the mine.

JULIA.—Sinking the shaft below the 1700-ft level is going ahead at a very rapid rate, the Burleigh drills in the bottom doing excellent work. The bottom is still in quartz, clay and porphyry, mixed. The character of the ground evidently indicates a near approach to the main ledge. There is no water whatever. The face of the main southwest drift on the 1600-ft level is still in quartz of a very encouraging character. The ledge on this level is showing much more concentrated than it was on the 1400-ft level, and the indications are still growing more favorable for the development of a paying mine at no very distant day.

GOULD AND CURRY.—No developments are being made on any of the lower levels, the entire work in the mine being confined to repairing the shaft, and the main north drift connecting with the Best & Belcher on the 1700-ft level.

ROBERT.—The mine is looking well at all points. The face of the south drift on the 350-ft level is showing some very rich ore, the drift advances to the southward. The north and south drifts on the 500-ft level are each steadily advancing, running parallel with the ledge, and cutting occasional streaks of fine quartz and ore of a very encouraging character.

BALTIMORE AND AMERICAN FLAT.—It is the intention to crowd the shaft downward to the 1250-ft level, at which point a new ledge will be immediately opened. The prospecting drift on the 1050-ft level is steadily pushed ahead, the face in very favorable ledge material. The face of this drift has been drawing a strong flow of water for several days past.

YELLOW JACKET.—A new and important ore development was made yesterday in the middle cross-cut on the 1940-ft level. Just the extent of this discovery, of course, cannot yet be determined; but so far as development looks very much as if the Yellow Jacket was on the point of again coming to the front ranks with another rich ore body.

UTAH.—The repairs to the drifts and air winzes on the 400-ft level are nearly completed. The lining of this portion of the work again gives an excellent ventilation of the entire mine from the 400-ft level to the surface.

KNICKERBOCKER.—Some time since all work was stopped on the lower levels by a heavy flow of water from the face of the drift. This water has again been drained, and work will be commenced on both the 600 and 700-ft levels in a very short time.

AMAZON AND GLASGOW.—The new hoisting machinery was started into full operation on last Monday, the whole working with the utmost perfection. The water is now nearly drained from the shaft ready to resume sinking and cross-cutting the ore vein on the third station level.

ALTA.—The main shaft is now down 1,045 feet. The flow of water is slight; excellent progress is being made.

NORTH CARSON.—The ore developments on the 300-ft level are showing more favorable every day. On the east side of the ledge the rich vein of ore found on the level above has widened to four feet, the whole being of a rich milling quality.

NIAGARA.—The new works are completed, and sinking the main incline shaft has been resumed under the most favorable auspices.

GLORY CORN.—The north drift on the 300-ft level is steadily advancing, the face showing some very favorable streaks of ore. A drift south has been started in the ore vein on the same level, which is also looking quite encouraging.

PICOT.—Some little increase of water is met with in the north drift, and better assays have been obtained from the quartz seams in the face of the drift during the week.

SILVER CITY.—The ore stopes in the raise from the bottom of the shaft are yielding rich ore.

BUCKEYE.—The shaft has been drained and work resumed on the lower levels. Ore of a good milling quality is being extracted.

LADY WASHINGTON.—Sinking the shaft is making excellent headway, the bottom in soft ledge material. The indications grow more favorable every day.

LEO.—The face of the south drift from the bottom of the winze is still in fine ore, and the amount of ore has already been extracted ready for milling.

HALE & NOBLES.—Excavating and putting in the stone foundations for the coming new and powerful pumping machinery is being pressed toward completion with all possible haste.

CALEDONIA.—The flow of water is still great, but is easily handled by the pumps.

HEBRON.—The new machinery is now received and on the ground, and is being put in position as fast as possible.

CHOLLAR-POTOSI.—No ore is being extracted on account of the condition of the roads. The erection of the powerful hoisting engine is going forward as fast as the nature of the work will admit.

NORTH CONSOLIDATED VIRGINIA.—Sinking the shaft is making the usual good progress, the bottom in good working ground, carrying streaks of quartz of a very favorable character. It is now down 675 feet. The flow of water shows slight increase.

SAVAGE.—The pumps and bailing tanks still hold the water at the 1800-ft level. Nothing is being done in the mine whatever except cutting out for the pump stations for the new pumps.

OVERMAN.—Owing to a disarrangement of some of the machinery, nothing has been done in the shaft during the past week.

SULLIVAN.—The foundations for the new machinery are completed, and the cross-cut has been penetrated the ledge for a distance of 250 feet, the face still in quartz and low grade ore.

SILVER HILL.—Sinking the main incline has been stopped on account of the strong flow of water, which made it necessary to put a plunge pump to work at the head of the incline.

NORTH DAYTON.—The quartz in the face of the north drift is very rich, but gives excellent average assays to both gold and silver.

BEST AND BELCHER.—There is nothing doing in the mine, except the prosecution of the repairs to the main drift connecting with the Gould & Curry on the 1700-ft level.

TRJAN.—The erection of the new hoisting works is progressing rapidly.

DARDANELLES.—The face of the north drift, on the 1400-ft level, is looking much more favorable.

OSCEOLA.—The face of the main north drift still continues in good paying ore.

ALTA.—The shaft is drained of the flow of water recently struck and the sinking has been resumed.

NEVADA.—Continued improvement is met with in the face of the main north drift, more quartz coming in which gives better assays.

SUPERIOR.—Shaft 58 feet deep. No water to interfere.

ORIGINAL GOLD HILL.—South ore body continues looking well.

(Continued on Page 220.)

PAGE has presented in Congress resolutions of the California Legislature, asking further appropriations for Oakland harbor, and that a lighthouse and oak be placed in Carquinez straits.

Mines and Mining Down the Creek.

Time was when the major part of the gold sent from the Grass Valley mines came from below Boston ravine. Then Rocky Bar, Massachusetts Hill, New York Hill, North Star, Lone Jack, Allison Ranch, and others, produced their millions annually, and sometimes monthly, and all the hills and slopes were dotted with the cottages of busy and prosperous miners. Then from one cause and another, but in no case because the lead was worked out, these mines were "hung up" and the prosperity of Grass Valley depended mainly upon the Eureka, Idaho, Empire and other mines up the creek and across from town, and many a deserted cabin and cottage betokened the change down the creek; but a large number of families have remained in their little homes, the heads thereof while away over the mountains earning wages being confident that the day would come when their services would be needed here again. The time is evidently near at hand. A little over a year ago, when the North Star shut down, the only mining work going on in all that region below town was on the New York Hill and Omaha, then just exploring with a few men. Now each of these mines is working hundreds of men, and gold bullion in good quantity is regularly turned out; the Franklin Allison Ranch, an extension of the famous old mine, is about putting on pumping and hoisting machinery to take out the quartz already proved to be paying in quantity and quality; the Homeward Bound, which lies between the Franklin and the Lone Jack and Omaha, has extensive machinery purchased, to be put on and in motion as soon as the roads permit of hauling; this mine has been prospected near the surface its entire length and the pay chute proved to be continuous, so there is no doubt in the minds of miners who have worked there of its capacity for making a paying mine; the Prospect is only waiting the decision of its managers as to the kind of reduction works to be put up to step into line as a bullion producer; big Fryer works are to be put up on Perrin's mine near Forest spring; the owners of the Lone Jack, on a home side proposition to purchase, a short time since, asked \$100,000 for the property, so it is not likely, with good prospects and encouragement on all sides it will be allowed to remain idle long; the North Star gives certain premonitory symptoms of resumption—we are not at liberty to say exactly what; Rocky Bar is moving slowly but surely in the direction of starting up that host of Grass Valley mines, and altogether the outlook for lively times down the creek is extremely flattering. A thousand additional men set at work in that direction during the Centennial year would add largely to the business and prosperity of Grass Valley.—*Foothill Tidings.*

SILVER COIN.—Advice from Washington dated March 20th says: The Treasury Department will receive during the present week from San Francisco 14 tons of silver coin. In consideration of the period of commencing the circulation of silver, this will amount to a half million. The amount of silver in the vaults of the treasury at the present time is less than \$30,000. Orders were received at the department to-day for \$120,000 fractional currency, and that amount will be shipped to-morrow to the various points from whence the requisitions were made. There are \$2,000,000 fractional currency still in the vaults, though none has been printed since the middle of last month. Since that time the requisitions upon the treasury from bankers and others, and officers of the treasury to be supplied with fractional currency, have amounted to about \$3,000,000. Several parties have visited the treasury recently with various amounts of silver coin that they had been hoarding, wishing to have it exchanged for notes. The department has in all cases refused to make the exchange, the banks declaring that this class of coin is neither to be redeemable nor exchangeable, and is a legal tender to the extent of five dollars only. The amounts presented have varied from \$5 to \$50.

BULLION CERTIFICATES.—A bill has been introduced into Congress for the purpose of utilizing gold and silver bullion, by permitting it to be received on deposit at the Government depositories, and issuing a certificate to the holder representing its value. An engrossment of this kind was made by the Bulletin several years ago. The operation would certainly be a very convenient one to bullion producers, and would often be a great relief to the money market. It is within the province of a bank or a capitalist to receive bullion, and issue a certificate for its value, redeemable in bullion at the pleasure of the holder. Such a course, however, is surrounded with too many objections to make it popular. Were the Government to sanction the proceeding, public confidence would be enlisted, and the certificates would be received in financial and mercantile circles. From \$7,000,000 to \$8,000,000 might be employed in this way in the payment of duties on imports at this port, in the same manner as 90 per cent. of the duties at New York are paid in gold certificates. The proposition ought to receive the favorable attention of Congress.—*Bulletin.*

The roads are so bad in the vicinity of Fort St. Vrain, Butte county, that ore cannot be taken from the mines to the quartz mill, so mill work is temporarily suspended.

MEASURES are being taken by the Senate Committee on Indian affairs, tending to the cessation of the Black hills to the United States.

The Value of Small Savings.

Few young men have a just appreciation of the importance of small savings at the outset of life. Wealth has quite as powerful a tendency to gather in masses as it has to dissolve into fragments and be scattered. Every little helps; dimes soon become dollars, and dollars can be made to double themselves in due course of time. Most young men, as well as their elders, have small vices, but seldom stop to think what these vices cost in cash, or what might be accomplished with this cash, were it wisely instead of uselessly invested. Suppose a young man is addicted to smoking. He might effect a worse vice, but we will take a mild one for example.

In a week he will consume a quarter of a pound of smoking tobacco (twenty-five cents) and three cigars per day (which is very moderate) at 10 cents apiece, and by the end of the week will have puffed two dollars and thirty-five cents into the air. Three cigars a day at 10 cents apiece make 30 cents, and a 30 cents a day for a week make two dollars and ten cents, which, added to the quarter of a pound of tobacco, make two dollars and thirty-five cents. In a year this would amount to \$122.20. We will suppose the young man to be 21 years of age. Now, instead of smoking this coin away, suppose he should place it in a saving bank at nine per cent. interest, and let it remain there, how much would this little economy alone amount to if he faithfully followed for 10 years? At the end of the first year, as we have said, he would have \$122.20. At the end of the second year the interest on this would bring it up to \$131.97, plus \$122.20 more which he has saved in the same way, making a total at the end of the second year of \$254.17. This, at the end of the third year, by reason of the interest, would amount to \$277.03, and, plus the \$122.20 additional, would make a total of \$399.23 saved in three years. Following the same rule of calculation he would be worth \$557.34 at the end of the fourth year; \$729.67 at the end of the fifth year, \$917.48 at the end of the sixth year, \$1,122.25 at the end of the seventh year, \$1,345.45 at the end of the eighth year, \$1,588.75 at the end of the ninth year, and \$1,853.96 at the end of the tenth year. Should he deposit his savings on this score every three months instead of annually, the gross sum would amount to more than \$1,900. He would be worth that much, at least, at the age of 31, and many a man starts in his career on a less sum.

If he not only avoids smoking, but drinking, billiard-playing, and all other amusements and convivialities that are not at all necessary to his happiness, and saves his money prudently, is there any doubt but that he will be able, at his 31st year, to muster ample capital to safely engage in the business he has been learning thoroughly in the meantime? These calculations are of course based on the supposition that his employment is unbroken. Few young men who secure staple situations never lose them if they attend strictly to their business. Billiard playing costs about three times what smoking does, and there is no limit whatever to the cost of drinking.

If a young man is born to fortune it is advisable that he should devote time to acquiring graceful accomplishments, and it is well enough that he should indulge a taste for lavish wardrobe; but if he is poor and has his way to make in the world, his sole business from the outset should be to prepare himself for making money, and to learn how to make it. He can do nothing without capital, and while he is learning his business he should be gradually acquiring his capital. It is the easiest thing in the world for him to do it if he only pursues the right course, and pursues it systematically. If the government seeks to prepare a future officer of the army it takes a boy 17 or 18 years of age, withdraws him from parental control, excludes him from society, guards him against prevailing vices and frivolities, and requires that he shall devote a series of years to the patient and unremitting study of his profession. When he has mastered its theory, he is usually transplanted to some remote frontier post, there to participate in its actual practice in a subordinate capacity. All our great generals have been trained and disciplined in this manner. The young civilian has severer struggles before him than the military cadet, and has need of more fortitude, self-denial, and eagerness throughout. He should therefore make up his mind at the outset that money is the main, essential object of his worldly pursuits (no matter what may be said to the contrary), and stick tenaciously to a life of policy and conduct that will eventually lead him on to success and comparative fortune.

THE KENTUCKY "FLESH SHOWER."—The telegraph recently announced a shower of flesh which fell in Bath county, Ky. on the 3d inst. The flesh, which covered two acres of ground, resembled mutton, and left traces of blood on trees and fences which were touched by the falling flakes. Chickens and hogs devoured it with evident relish. The heavens were clear, the sun shone, and only floating clouds were visible at the time, 2 p. m. Some of the flesh that was brought to Louisville was given to Professor Lawrence Smith, the well known scientist, who at first pronounced it animal flesh; but on further examination decided that it gave every indication of being the dried spawn of batrachian reptiles, doubtless that of the frog, which had been transported from ponds and swampy grounds by currents of wind, and had ultimately fallen on the spot where found.

Useful Information.

Lubricating Oils.

"A simple method for testing the hydrocarbons or mineral oils in lubricators is to fill a bottle with the oil in question, moistening the cork and inside the neck of the bottle, and then twisting the cork about its longer axis. The best lubricating oils produce no sound, but the more the oil is adulterated with hydrocarbons and products of dry distillation, the louder the noise produced. An oil that gives a loud cry is most unfitted for a lubricator."

Upon the above item, which has gone the round of all the scientific papers in the country, the *American Manufacturer* comments as follows: The method proposed is indeed "simple"—we have been submitting some oils to this test, not, of course, to prove the correctness of the test, for with the endorsement of all the scientific papers we should not presume to do that—but we find that we must change somewhat the estimate in which most oils have been held to make them conform to the standard set up in this simple test. A few examples will show what we mean.

Pure sperm produces no sound, therefore it is a good lubricant. Pure sperm mixed with an equal quantity of paraffine oil produces no sound, therefore it is as good a lubricant as pure sperm. Pure rosin oil produces no sound, therefore it is a good lubricant. Pure fish oil produces no sound, therefore it is a good lubricant. Coal tar produces no sound, therefore it is a good lubricant. Dowder's best spindle oil gives a "loud cry," distinctly heard at 100 feet distance, therefore it is "unfitted for a lubricant." Paraffine oil gives a distinct "cry," therefore it is a poor lubricant. (N. B. Paraffine oil is in general use either alone or "adulterated" with sperm in nine-tenths of the cotton factories in this country, and gives entire satisfaction, but then the "test" says it is not a lubricant.) Pure West Virginia oil gives a slight cry, therefore it is not as good a lubricant as petroleum residuum, which gives no sound, and is therefore a good lubricant.

We need not continue to record our tests. Every one who knows enough to handle a pen or a pair of scissors for a scientific paper must admit that the publication of such things only adds to the world's ignorance, not to its knowledge.

MAIZE AND NUTMEGS.—Most of our readers doubtless know that the nutmeg, like all other spice, grows in tropical countries. The fruit of the nutmeg tree, especially as it approaches maturity, is very like a large yellow peach. At maturity the outer hull opens, and if not gathered the valuable product would soon fall to the ground. The mace is the second coat which covers the nutmeg, and almost envelops the dark, impervious hull, or third covering of the nutmeg. When the product is gathered the mace is of a deep red color, and is taken carefully from the hull which still incloses the nut. Then the hull is broken and the nut taken out, when it is ready for market. In the palm days of the "Hon. East India company," all the company's possessions were governed by 24 gentlemen in London, called the "Hon. Court of Directors," who had spent their lives from early manhood to middle age in India, were usually the company's most distinguished civil and military servants, and were supposed to know everything pertaining to the interests of the great corporation. They superintended the sale of all Indian products, and, finding at one period that the mace sold more readily than the nutmeg, they wrote to the government in India to cultivate more of the mace and less of the nut!

LIGHTHOUSE WHITE-WASH.—The following are the ingredients which compose the white-wash sent out by the Lighthouse board of the Treasury Department, and which, it may reasonably be supposed, is the preparation which the best knowledge and fullest experience has selected from the many which are used for the purpose indicated: Slack one-half bushel of unslacked lime with boiling water, keeping it covered during the process. Then strain it, and add a peck of salt, dissolve in warm water, three pounds of ground rice put in boiling water and boiled to a thin paste, half pound powdered Spanish whiting and a pound of clear glue dissolved in warm water. Mix these well together and let the mixture stand for several days. Keep the wash in a portable furnace, and when used put it on as hot as possible with either a painter or white-wash brush. Thus prepared, this wash has been found, by experience, to answer on wood, brick or stone nearly as well as oil paint, and it is much cheaper.

HARDENING SPRINGS.—Get a piece of spring steel about the size of spring wanted; when forged end filed to tilt, make it warm red, immerse in spring water, dry the spring, then tie a piece of wire fast to the spring in any form, so as to hold it; dip in clean tallow or oil, put it on the fire until all the grease is burned off, and then swing round and round, as swift as you can, until cold.

A NEW MUCILAGE.—The *Journal de Pharmacie* states that if, to a strong solution of gum arabic, measuring eight and one-third ounces, a solution of 30 grains of sulphate of aluminum dissolved in two-thirds of an ounce of water be added, a very strong mucilage is formed, capable of fastening wood together, or of mending porcelain or glass.

BICYCLE VS. HORSE.—A ten mile race, between a fast horse named Happy Jack and a velocipede rider named Stanton, recently took place at Lillie Bridge, England, for \$250. For the first three miles the horse kept level with the bicyclist. The ground was rather sticky, owing to the late rains, for both, and Stanton seemed laboring, but this is his peculiar way of riding. Stanton was the favorite at as much as three to one, for the start allowed him was generally considered too much. For three miles the horse went easily; where he lost at the corners he made up in the straight. This style he kept up until the sixth mile, when his stride began to falter, not being ridden so well as on the last occasion, combined with the effect of the extra weight he was carrying. Stanton from this point gradually went ahead, and in the next mile he gained 50 yards. The horse was now beaten, and after going another lap was pulled up at eight miles. Stanton went on and finished the distance, 10 miles less 764 yards, in 34 minutes 34 seconds, being at an average velocity of nearly 18 miles an hour. He rode a 58 inch machine made by Keen, weighing 40 lbs. He seemed to have a good deal more in him had it been required.

SHARPENING EDGE TOOLS.—We copy the following recipe for sharpening edge tools from a German scientific journal, for the benefit of carpenters, machinists and laborers: "It has long been known that the simplest method of sharpening a razor is to put it for half an hour in water to which has been added one-twentieth of its weight of muriatic or sulphuric acid, then lightly wipe it off, and after a few hours set it on a hone. The acid supplies the place of a whetstone by corroding the whole surface evenly, so that nothing further than a smooth polish is necessary. The process never injures good blades, while badly hardened ones are generally improved by it, although the cause of improvement remains unexplained." The cause of this improvement is simply that those particles which are softer contain less carbon, are most attacked by the acids, and thus removed by them; while the harder particles—the more perfect steel—is richer in carbon, which causes it to resist the action of the acid better, and they remain. For the same reason, old rusty tools, when cleaned and sharpened, are always better than when they were new.

KEROSENE is making rapid advances against coal gas all over the country. The cost of oil light is about one-sixth the cost of gas light, and there is no doubt that it affords a far better light for the eyes. We do not see how the gas companies are to stem the tide that seems to set against them, except by adopting petroleum themselves and thus enabling themselves to reduce the price of gas to a point nearer the cost of oil light.

SOFTENING FILES.—Cover them with oil and hold them over the fire until the oil blazes; as soon as the flame runs all over the file, plunge it into the water. Or, put them into a moderate hot oven, for half an hour, if large files; but if small files, the first plan is the best.

Good Health.

Regulating the Bowels.

It is best that the bowels should act every morning after breakfast; therefore, quietly remain in the house and promptly attend to the first inclination. If the time passes do not eat an atom until they do act; at least not until breakfast the next day, and even then do not take anything except a single cup of weak coffee or tea and some bread and butter, or dry toast, or ship biscuit.

Meanwhile arrange to walk or work moderately for an hour or two each forenoon and afternoon, to the extent of keeping up a moisture on the skin, drizzling as freely as desired as much cold water as will satisfy the thirst, taking special pains as soon as the exercise is over to go to a good fire or very warm room in winter, or, if in summer, to a place entirely sheltered from any draft of air, so as to cool off very slowly indeed and thus avoid taking cold or feeling a "soreness" all over next day.

Remember that without a regular daily healthful action of the bowels it is impossible to maintain health or to regain it if lost. The coarser the food the more freely will the bowels act, such as corn (Indian) bread eaten hot, hominy, wheaton grits, bread made from coarse flour, or "shorts," graham bread, boiled turnips, or strabout, or grapes, or dried figs, or stewed tamarinds. A handful or two of raw or boiled chestnuts eaten during the day; a tablespoonful, more or less, thrice a day of white mustard seed swallowed whole, in water or otherwise; eating freely of parched corn; taking on rising a tumblerful of cream which has been allowed to stand until it has thickened, whether sweet or sour, are means which are sometimes successful in keeping the bowels acting freely once a day, without the necessity of taking medicine. When one fails to keep up a good effect, try another, in the hope that when the bowels have got into a habit of regular action it may be kept up by the judicious employment of such daily food as observation may show is best adapted to the object. The habitual use of pills, or drops, or any kind of medicine whatever, for the regulation of the bowels, is a sure means of ultimately undermining the health, in almost all cases laying the foundation for some of the most distressing

of chronic maladies. Hence, all the pains possible should be taken to keep them regulated by natural agencies, such as the coarse foods and exercises above named, or stewed prunes, or a glass of water on rising, into which has been stirred a teaspoonful of salt or a heaping tablespoonful of corn meal. Reliance on injections is disastrous eventually.

If the bowels act more than twice a day live for a short time on boiled rice, farina, starch or boiled milk. In more aggravated cases keep as quiet as possible on a bed, take nothing but rice, parched brown like coffee, then boiled and eaten in the usual way; meanwhile drink nothing whatever, but eat to your fullest desire bits of ice swallowed nearly whole, or swallow ice cream before entirely melted in the mouth; if necessary wear a bandage of thick woolen flannel, a foot or more broad, bound tightly round the abdomen; this is especially necessary if the patient has to be on his feet much. All locomotion should be avoided when the bowels are thin, watery or weakening.—*Hall's Journal of Health.*

The Scarlet Fever.

It is as unnecessary for a child to die of scarlet fever as it is that it should be blind with catarrh. Let us see: At any time before the body has finished its ineffectual struggle we are able to help it, not by wonderful medicines but by the knowledge of anatomy and the application of common sense. We consult the sympathetic nerve and do what it commands us to do. We must give this child salt when it wants it; we must give it acid when it has fever—not vinegar but lemon juice, because the first coagulates albumen and the latter does not, on account of the surplus of oxygen which it contains. To imitate the soothing mucus in the intestines, which is now wanting, and to give some respiratory food at the same time, we add some gum arabic. To restore and relieve the injured nerve we apply moist warmth. In practice we can fulfill all this with the following simple manipulations:

Undress the child and bring it to bed at the very first sign of sickness. Give it, if it has already fever, nothing but warm, sourish lemonade with some gum arabic in it. Then cover its abdomen with some dry flannel. Take a well folded bed sheet and put it in boiling hot water; wring it out dry by means of dry towels and put this over the flannel on the child's abdomen. Then cover the whole and wait. The hot cloths will perhaps require repeated heat. According to the severity of the case and its stage of progress perspiration will commence in the child in from 10 minutes to two hours.

The child then is saved; it soon falls asleep. Soon after the child awakes it shows symptoms of returning inclination for food; help its bowels if necessary with injections of oil, soap and water, and its recovery will be as steady as the growth of a green-house plant if well treated. Of course if the child was already dying nothing could save it, or if it has effusions in the lining of the heart or brain it is much better that it should die. But if the above is applied in due time, under the eyes and directions of a competent physician, I will guarantee that not one in a hundred children will ever die of scarlet fever.

I know this will startle some of my readers, especially those who have lost children already, but I shall go still further. I maintain that a child will never get scarlet fever if properly treated. If a child has correctly mixed blood it will not catch the disorder if put in bed with a sick child. This is still more startling, but nothing is easier of proof.—*Good Health.*

Beds and Bedrooms.

Never use anything but light blankets as a covering for the sick. The heavy, impervious cotton counterpane is bad, for the reason that it keeps in the exhalations from the pores of the sick person, while the blanket allows them to pass through. Weak persons are invariably distressed by a great weight of bed clothes, which often prevent their getting any sound sleep whatever. It is better to sleep in a cool room and dress in one that is well warmed, than the opposite. If it is necessary to heat the bedroom, let it be by means of an open grate fire, rather than by a register or flue.

In view of the fact that most people pass one-third of the 24 hours in bed, the importance of having only the best bedding needs no argument. There is no wisdom, therefore, in buying cheap or second-class articles for the sleeping room, but true prudence directs to get the very best bedding that your means will command; a first-class hair mattress will outlast two of inferior quality. The same difference will also be found in respect to feathers, and with the latter as with hair, the best is always cheapest. Too many young housekeepers neglect to follow this rule, and pursue a penny-wise and pound-foolish policy, when they might just as well have adopted the opposite practice.

SCARLET FEVER.—In this disease the parent and the school teacher are often concerned to know how long a time must elapse before it is safe to admit the convalescent children to mingle with other children. And the answer is, that for a month, at least, the body of a scarlet fever patient is casting off scales from the skin, and from the nose, throat, bowels and kidneys discharges which are poisonous and convey the disease. The chief danger, however, arises from the skin, as this is the main outlet for the blood poison to escape; hence every scale it throws off can carry the infection.

Domestic Economy.

Cooking Carrots.

It is a notorious fact, says the *Boston Journal of Chemistry*, that we Yankees, like our English cousins, are lamentably unskillful in cooking vegetables, which the French serve up in such an endless variety of delicious forms. In the country, where fresh vegetables can be had so easily, they are even worse treated than in the city. In fact, they are usually cooked for the family just as they are for the cattle and the pigs. There is no more thought in the one case than in the other of making them savory as well as wholesome. We have before given some excellent foreign recipes for cooking potatoes, which with us are almost invariably boiled or fried, and abominably in either case. We now select from the *London Garden* some hints for cooking carrots, which the average Yankee housewife never thinks of serving in any other way than "plain boiled." The contributor has tested all these, and vouches for their merit:—

CARROT SOUP.—Take one and a half pounds of carrots which have been first brushed very clean, then boiled, until tender, in slightly salted water; mash them to a smooth paste, or rub them through a sieve; mix the paste with two quarts of boiling soup (strong beef broth will do); season this with pepper and salt, and add, before being finally boiled up, a small lump of sugar and a piece of butter. Serve with a dish of bread cut into small dice and fried in butter.

CAROTTES A BEURRE.—Boil sufficient carrots for a dish until they are quite tender; drain them well, and whilst this is being done, dissolve from two to three ounces of butter in a saucepan, and strew in some minced parsley, some salt, and white pepper or cayenne; then add the carrots, and toss them very gently until they are covered with the sauce, which should not be allowed to boil. Cold carrots may be rewarmed in this manner.

STEVEN CARROT.—Half boil a half dozen large carrots without cutting them; then slice them into a stewpan; put in enough good stock to nearly cover them, with pepper and salt to taste. Stew them till tender; then mix in a separate vessel half a pint of cream and a tablespoonful of flour, and add to the carrots with one ounce of butter. Boil up and serve. Small young carrots may be dressed in the same manner, and will, of course, require less time to cook them.

CAROTTES A LA MARIÉE D'HOTEL.—This is a genuine French recipe. Scrape twenty small young carrots and wipe them, but do not wash them. Put them into a pan with six ounces of fresh butter; cover the pan and toss the carrots over the fire from time to time. After a quarter of an hour add salt and pepper, a chopped onion and parsley. Cover the pan and gently toss it again from time to time, until the carrots are tender. If you use large carrots, cut them into slices and boil them in water until they are nearly done. Drain and finish them as above.

CAROTTES A LA POULETTE.—Take some young carrots; scrape and wipe them carefully. Put them in a pan over a moderate fire, with six ounces of butter and a tablespoonful of flour; toss them repeatedly, and take care the flour does not become brown. Pour a tumblerful of milk into the pan, cover it and let the carrots simmer slowly until they are done. Then take the pan from the fire, and pour into it two yolks of eggs, mixed with a tablespoonful of good cream, and a little pepper and salt; warm these ingredients, taking care not to let them boil, and serve.

CAROTTES AU JAMBON.—Put into a pan six ounces of butter and a tablespoonful of flour; simmer these over a quick fire, until they become slightly brown. Add a gill of boiling water, then six ounces of raw ham cut into small dice, a little salt and pepper, a bay leaf, a small bunch of thyme and parsley, a large onion, and six large carrots cut into slices the size of a half crown. Cover the pan, and let the carrots boil until they are done. Then take out the seasoning, and serve. This recipe also answers well for turnips.

SPLIT PEA SOUP.—Take any bones of roast meat, lay them on a clean meat board, pound and break them, (a small hatchet carefully wiped clean is very good for this purpose). Put the bones and any trimmings of cold meat into a soup kettle or a large saucepan, cover well with cold water, set it on the back of the stove, cover it closely. When it first bubbles, skim it well, cover it, and let it simmer slowly four hours. If necessary to prevent it from boiling hard, set a tin plate on a brick under the saucepan. At the end of four hours take the soup from the fire, pour off the liquor through a strainer or colander into a shallow pan, let it become cold, then remove every particle of fat from the surface, and strain the soup through a cloth. An hour before it is wanted, put it on the stove to heat. Allow for three pints of stock, a large coffee cup full of split peas, which should be soaked if very old. Pour off those which rise to the top, put the others on the stove to boil for two or three hours, until they are perfectly soft. Then rub them through a colander, and when the stock is boiling, add the peas, and a small piece of butter, end pepper and salt. This soup is good and nourishing, besides being very economical. Excellent broth and soup can be made of bones left from roast meat of any kind, and they should be saved for the purpose.

MINING SCIENTIFIC PRESS

W. B. EWER..... SENIOR EDITOR.

DEWEY & CO., Publishers.

A. T. DEWEY, GEO. H. STROGO
W. B. EWER, JNO. L. BOONE

Office, No. 224 Sansome St., S. E. Corner
of California St., San Francisco.

Subscription and Advertising Rates:

ADVERTISING RATES.—1 week, 1 month, 3 months, 1 year.
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One inch..... 1.50 4.00 12.00 40.00

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We wish to thank those subscribers who send to
their respective to the Press promptly as regularly as
the year comes round. It saves us much expense to
commissioners for collections and renewals. May we not
request more of our good patrons to do so!

BE MORE PARTICULAR.—We can only make the
changes requested by the following parties on our
mail list, when they, or some one else, send us their
P. O. address. Otherwise we would have to look over
from 1,000 to 10,000 names. Frank Becker, O. Seawell,
L. Boyer, M. Lewis, F. Anson, and Antonia Byros.
We also want the address of Wm. Buck.

UNKNOWN.—We have lately received cash at this
office without due explanation, as follows: From Car-
son, Nev., \$4, by express.

The senders will please give full address, date of
sending, etc.

THE ORIGINAL ARTICLES in this paper are mostly set
in solid type, giving to our columns one-third more
reading than is contained in ordinary leaded matter.

Our latest forms go to press on Thursday evening.

San Francisco:

Saturday Morning, April 1, 1876.

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New England Tunnel and Smelting Co.—Sale; Notice,
Geo. Ginn, Belmont, Nev.

PACIFIC IRON WORKS.—A very heavy casting
was made at the Pacific iron works this week,
in the shape of the large cylinder for a com-
pound engine, which is being built for the
pumping machinery of the Savage mine, on the
Comstock. The cylinder is 48-inch bore and
eight feet stroke, weighing sixteen tons. The
engine is a compound one, with the Davy differ-
ential valve gear, worked by an independ-
ent cylinder. With this machinery goes a
line of 13-inch pumps and two sets of pump
boots; the pump column reaching to the 2200-
foot level of the mine. We shall shortly give
a detailed description of this fine machinery.

The Truckee Indians have made affidavit
that it would cost \$500,000 the first year and
\$50,000 thereafter to consume their own saw-
dust or otherwise so use it as to keep it out of
the stream; hence they claim that it is better
the trout should die than the sawdust kill them.

ONE hundred and fifteen car loads of ore per
day is the average shipment from the Com-
stock mines to the Silver City and Carson iron-
mills.

The crowded state of our advertising columns
just at present prevents our publishing the
usual amount of reading matter.

Tellurium.

Considerable excitement has been raised by
certain interior papers of this State, by the an-
nouncement of the discovery of tellurium, and
the statement that it was worth \$3,000 per
pound. In several counties in the interior this
has set a number of prospectors at work, with
the expectation of making a fortune in a very
short space of time, before the supply should
be so increased as to reduce the price. Num-
bers of samples of ore, supposed to contain
tellurium, have been sent to assayers in this
city and elsewhere, by sanguine claim-holders,
who think they have a good thing. We are
sorry to dispel the illusion as to the value of
the article; but are, at the same time, happy
to avail ourselves of the opportunity to explain
to our mining friends, who may be making
foolish ventures, exactly what tellurium is, how
to test its presence, and how much it is worth.
With this object in view, we interviewed Mr.
Henry G. Hanks, the well known chemist and
assayer of this city, who gives us the following
information concerning the substance:

Tellurium is a white metal, brittle and easily
fusible. Its equivalent or combining weight is
64.2 in the old system of notation, which is
doubled in the new. The symbol used by
chemists to express this element is "Te."

Tellurium was discovered and named by
Klaproth. The specific gravity of the metal is
6.257.

The name tellurium is derived from the
Latin word "Tellus," the earth. The word
"tellurio" has no reference to the metal, but
implies, pertaining to the earth.

This metal is very rare on the earth, but
exists in a gaseous state, probably combined
with hydrogen, in the atmosphere of some of
the fixed stars, as revealed by the spectroscope.
It is particularly noticeable in Aldebaran.
I think I am not mistaken in stating that it has
not yet been discovered in the sun.

Tellurium, as far as known, is found only in
ten rare minerals, as follows (the figures show-
ing the percentage of tellurium in each):

1. Altaite, combined with lead.....	38.3
2. Calaverite, combined with gold and silver.....	56.0
3. Hessite combined with silver.....	37.2
4. Joesite, combined with sulphur, selenium and bismuth.....	15.93
5. Nagyagite, combined with sulphur, lead, silver, gold and copper.....	30.52
6. Petzite, a variety of hessite (No. 3).....	
7. Sylvanite, combined with antimony, gold, silver and lead.....	44 to 60
8. Tellurium, native, nearly pure.....	
9. Tetradyomite, combined with silver and bismuth.....	33 to 43
10. Tellurite, doubtful.....	

Tellurium is not only fusible, but is volatile,
and may be sublimed in a glass tube without
change. When exposed to high temperatures it
becomes oxidized to tellurous acid (TeO₂),
giving off dense white vapors. If the experi-
ment is made in a piece of clean charcoal before
the blow pipe flame, a coating is formed on the
coal. If this coating is touched by the point
of the reducing flame, it disappears, tinging
the flame at the same time bluish green. This
reaction is characteristic. Any substance con-
taining tellurium imparts a red color to boiling
concentrated sulphuric acid. By these tests,
tellurium may be detected with certainty in any
substance which may contain it.

The statement lately made in the papers, that
a firm in San Francisco had paid \$3,000 for
one pound of tellurium, is evidently a mistake.

At the rate of 51 cents per gram—at which
price it is quoted in German price lists—a
pound would only be worth \$231.54. But when
it is known that dealers make large discounts
on their printed list of prices, and that whole-
sale rates are much less than retail, it is evident
that so large a quantity as a pound could be
bought for a much less sum.

Tellurium has absolutely no use in the arts.
It is only prepared in small quantities as a
chemical curiosity. All the reactions of the
metal can be obtained by students from some
of the minerals containing it, which are com-
paratively cheap. Like every other manufac-
ture, its production is governed by the laws of
supply and demand. In this case both the
supply and demand are small; hence there is
no inducement for its production, and those
who do produce it naturally realize all they can
from their small sales.

As an illustration of how the price of a
commodity decreases when inducements are
offered for its large manufacture, I have only to
cite the metal sodium, which a few years ago
was very high-priced for the same reason that
tellurium is at the present time, although the
supply was enormous, the dispersion of sodium
being greater than that of almost any other
substance. When the demand increased—it
being required for the manufacture of sodium
amalgam, and for the reduction of aluminum—
new methods of producing it were discovered,
and it has now become quite cheap and abun-
dant.

Tellurium is found in considerable quantities
in Schenitz, Hungary, and in the silver mine
of Sadoivinski in the Alai, associated with sil-
ver and lead. At the mine "Maria Loretto"
in Transylvania, in sandstone, with quartz,
pyrites and gold. From this locality (Transyl-
vania) the name "sylvanite" is derived.

In the United States it has been discovered in
Virginia and North Carolina associated with
bismuth (tetradyomite).

Fine specimens come to us from the Ameri-
can mine, Sunshin district, Boulder county,
Colorado.

In our own State it is not rare, being found
in considerable quantities in several localities.
The Melones mine, Calaveras county, is a
celebrated locality. Splendid specimens of cala-
verite, hessite, sylvanite and native tellurium
associated with gold have been shown in this
city. The Golden Rule, Tuolumne county, pro-
duces fine species of hessite and petzite. The
R.W. Hyde Ranch is another locality.

According to Dana, petzite and calaverite
have been found at the Stanislaus mine in
Calaveras county.

Metallic tellurium is principally obtained
from the telluride of bismuth (tetradyomite).
The ore is first washed to concentrate it, then
mixed with an equal weight of carbonate of
soda or potash. The mixture is then made
into a paste with olive oil, and heated in a
closed crucible, first gently, to prevent froth-
ing, then at a high heat. The fused mass is
digested in water, which dissolves out the tel-
luride of soda or potash, giving a deep wine
colored solution. The bismuth and the char-
coal resulting from the burning of the oil re-
main behind.

If the liquid is allowed to stand exposed to
the air, the tellurium gradually precipitates
until it has all separated. This precipitation
can be greatly accelerated by blowing air
through the solution.

The precipitated metal is purified by wash-
ing in dilute acid and distilling in an atmos-
phere of hydrogen.

Notices of Recent Patents.

Among the patents recently obtained through
Dewey & Co.'s SCIENTIFIC PRESS American and
Foreign Patent Agency, the following are
worthy of mention:

IMPROVEMENT IN NICKEL PLATING.—Camillo
Maggio and Giuseppe Maffiola. These inven-
tors patent certain improvements in the art of
plating with nickel upon other metals. The
improvement consists, first, in the preparation
of the metal to be plated in such a manner as
to prevent rust or oxidation; and secondly, in
a new solution, by which they are enabled to
deposit the metal more perfectly and upon
metals which it has hitherto been impracticable
to protect with nickel. It is well known that
in the process of electro-plating the metal is de-
posited in the form of minute grains, and when
the metal is malleable, as in the case of gold
and silver, these grains are welded or united in
the process of burnishing so as to completely
cover and protect the whole surface; but when
nickel is deposited in this manner it cannot be
made to protect the surface any more com-
pletely than is done by a simple deposition of
the particles, on account of its brittleness, which
does not admit of burnishing. The surface
beneath is, therefore, more or less exposed to
the action of air, acids or other substances, and
will in time become oxidized or corroded in
spots, especially in the case of iron, steel, lead,
copper and other base metals. These inven-
tors overcome this difficulty in a very simple
manner. They are also able to deposit nickel
on zinc successfully by the use of a peculiar
bath.

REAPER.—David P. Russell, Dixon, Solano
Co. The object of this invention is to provide
a "header" with an automatic grain receptacle
and dropper so that it can be used as a reaper
by collecting the cut grain in the receptacle
until a sufficient quantity has accumulated to
form a bundle, and then dropping it. The in-
ventor simply makes a box attachment to the
elevated end of the draper, from which the
grain ordinarily falls into the header wagon,
and the bottom of this box is operated automa-
tically by gearing connected with the driving
mechanism of the machine, so that it will at
intervals open and close. The cut straw or
grain is carried by the draper and delivered into
this box, where it is retained, until a sufficient
quantity is collected to form a "gavel" or
loose bundle of grain, when the bottom of the
box opens and drops the gavel upon the ground.
Thus enabling farmers to utilize their headers
as reapers and do the work with a great deal
more celerity than with the ordinary reapers,
at the same time leaving the grain in gavels
ready to be bound.

IMPROVED WINDMILL.—John Brower, Perry
D. Reed and Jasper C. Reed, Colusa, Cal.
This invention relates to improvements in that
class of windmills which are made adjustable
by means of vanes or sails, which can be turned
about an axis, so as to throw them more or less
out of the wind. It consists in a series of ra-
dial arms, which are connected with the vane
sections by suitable rods. These radial arms
are mounted on the end of a shaft, and have a
motion longitudinally, so that it is drawn for-
ward when the wind throws the vanes back,
and a weight or spring draws it back as the
force of the wind decreases. When the wind
blows strongly the vanes will be thrown back-
ward more or less and the rotation of the wheel
regulated. When the force of the wind abates,
the weight or spring will draw the shaft back
again and return the vanes to their position.

Mrs. SANDY BOWERS, the Washoe seeress, has
closed her eyes again and now solemnly pre-
dicts another life destroying calamity for Vir-
ginia and the tapping at no distant day of a
subterranean river in the header of the Suto
tunnel.

REPORTS from the Black hills are discourag-
ing.

Higher Education.

The following is an abstract of a lecture on
the above subject, delivered by Professor
Joseph Le Conte, at the University of Califor-
nia, on Friday of last week.

My subject is higher education, old and new.
It is the subject of the age, not only of this time
but far more than this, of all times. It has no
interest in the passing questions of the day or
so-called "live questions," which rise to the
surface like bubbles, display their beautiful
colors, burst, and pass away. Hence it is not
a question of times, but of all time, a living
question. It is the basis of civilization and
more important at every step of education. It
is important now, because we are passing from
the much revered old to the new education. In
attempting to adjust this transition I am at
once placed in the knowledge of the dilemma,
that the time is insufficient. Hence, I must
choose between an address appealing to your
feelings, or a plain statement of facts. But I
must lay aside ornament, strip off this clothing,
dissect away and dwell upon the bare skeleton
of truth. We may, however, be sure that there
is a rich vein of marrow running through these
dry bones well worth the time employed in dis-
cussing.

Education is a preparation for active life. In
later times a discussion is growing up in re-
gard to higher education unfitting men for life.
There are grounds for this theory. Higher
education originated in the revival of learning
after its sleep during the middle ages. This
system of education was admirably adapted for
the study of ancient languages and books. It
gradually grew up into a system of intellectual
culture not equalled. There has been a prodi-
gious advance in sciences of nature and conse-
quently an advance in the departments of ed-
ucation. This learning is not recorded in hu-
man characters but in the hieroglyphic system
of nature—not found in books but in nature, of
which science holds the key. There has been a
graft upon the old branch, a teaching of a new
subject by old methods which is but imper-
fectly successful. Thus two classes which are
irreconcilable have arisen, one clinging to old
methods and the other, knowing that education
must be a preparation for life, would absolutely
wipe out old and introduce new methods. One
class are men of culture, the other men of prac-
tical business. One deals mainly with men,
the other with things. One seeks to elevate
men, making them nobler, the other to make
education a mere apprenticeship. The one is
the medievalist, the other the utilitarian. I
will show that both are right, and that both
are wrong. Each is right from his own stand-
point, and each is wrong by excluding the
other's views. Education is the preparation
and training for eminent success in life. Hence,
any scheme of education is of utility in pro-
portion as it prepares for this end. But we
must use life and utility in the widest sense,
life including moral as well as physical, spiri-
tual as well as temporal.

But now the term life is limited. We es-
timate men by the quantity of money they pos-
sess, we speak of a man's being worth so much.
Utility is also restricted in common language,
so we must use another term—culture. Educa-
tion has two ends and therefore there are two
kinds of education—first, general or liberal ed-
ucation, tending to elevate men in every re-
spect, and second, professional education as
preparation for special pursuits. I now wish
to show that these are not antagonistic but con-
secutive. The second grows out of the first by
the natural law of evolution. They may be
compared to a tree, the trunk of which repre-
sents culture and the fruit bearing branches
the special professions. Each one alone de-
feats its own objects. Culture alone fails to
prepare us for active life, while professional
education not only fails to develop us to
highest manhood, but also fails to fit us for
practical work when accompanied with culture.

In order to be useful, the tree must not only
have a trunk but also branches. The tendency
of culture is to disregard the professional study,
and hence becomes nearly useless. I maintain
that the two should be consolidated, but all do
not think so. We should not reject this ideal
because we cannot attain to it, for we are guilty
of meanness by rejecting it on this account. A
scheme of education is good in proportion as it
is natural. Nature has two modes of working
—external nature atrems in through our
senses, and we send back our knowledge in the
form of power; our fellow man acts upon us by
the means of language. The one is nature cul-
ture, and the other knowledge culture. The
first is the power over nature, and the other
over men.

Our system of education must have two
courses—First, nature course, and second, lan-
guage course. The phenomena of our spiritual
nature is so difficult to understand, that a third
class is necessary—human mind. Higher ed-
ucation is of two parts—college education and
university education. The object of the first is
culture for the sake of culture, and that of the
second is to concentrate our power to special
and higher ends. Every scheme of the higher
education includes three courses—First, scien-
tific; second, philosophical, and third, lan-
guage. The scientific course gives some truth,
and cultivates our love and ardor to strive for
truth. It goes up through the lower sciences to
the highest, which is social science. It gives
coarse but whole-some food. The philosophical
course gives strong muscular exercise to the
intellect, heats the intellectual blood and stimu-
lates the intellectual nerves. It passes from

logic through like sciences, till it also attains to social science. It may furnish food for gods, but not for man. The language course is the embodiment in sensible form of our innermost thoughts, either in speech or in writing. It commences with ancient languages, passes through modern languages, literature, art, history, and on till it approaches social science. At first they are widely separated, but gradually converge, and meet on the great plane of human civilization. Neither the first or the second are co-ordinate, but the third is co-ordinate, in thought and expression, when one gives and the other receives. There are two great loves of mankind—love of God and love of man. By one we reach above and commune, as it were, with Deity; by the other we shed light on our fellow man. We receive divine instruction and give it out again to man.

It is truly said "it is more blessed to give than to receive." This is cultivated by the study of language. In physical science we have physical force. In chemical science we have, in addition, chemical force, and so on up the scale. In lower science we have the methods of deduction, and the higher we go the more we find the use of the methods of induction and generalization, until in the highest science we have only induction. The one tends more to special ends.

Thus we may compare this culture to a temple of many stories, consisting of a large main building with two wings. The first class of teachers, the medievalists, lay the foundation only. The second class, the materialists, build only one wing. The first is worse, because their structure is of no practical use. If common schools are the roots of the tree of education, and colleges the trunk, universities are the fruit-bearing branches. There is a sort of gap between educational life and practical life—one tends to the abstract, the other to the concrete. In the lower grades, practical life and education differ but little, but the higher we go the farther they diverge. At the bottom it is very easy to step from the grammar school to active life. It is more difficult to step from the high school to active life, but when in college the transition is very difficult indeed, and in some cases impossible.

The very object of the university is to bridge over this chasm, to build a bridge from the higher branches of education to the higher branches of professional life, law, theology, medicine, civil engineering, education, chemistry, etc. This idea is not realized in any part of the earth, but is approached, perhaps most nearly in the German universities. They are still too far on the side of the medievalists and only recognize three liberal professions, law, theology, and medicine. The technical schools are separated from the universities. It seems to me that the conception in an embryonic condition is more fully realized in our university than in any other. The branches are budding and have not yet flowered. Last of all, a university is essentially a cluster of colleges. Shall we then have the general culture pursued in the University? Yes, but culture must be for culture's sake, and also for the professional scholar and thinker. Another object of culture is, that it ennobles all professions. It brings them into communion with one another. The university has a higher trunk, but also more fruit-bearing branches. The trunk of general culture must pass through the branches of special studies and appear at the top as a preparation for the nobler life.

Center Draft Tongue for Reapers.

The accompanying engraving represents Fassig's center draft tongue for reapers and mowers. The arrangements of this tongue are such that while the horses are hitched near the machine as in the old tongue, yet they pull on the center pivot which passes through the tongue near the front end, and the double-trees having a lateral sliding motion, can adapt themselves to either side of the main tongue, and thus equalize the draft in all conditions and positions of the machine.

A is the stationary tongue and B the center draft tongue joined to it by the center pivot, C. The spring, E, keeps it in position when drawing directly ahead. The point of resistance being on the pinion near the front end of the tongue, keeps it perfectly still and renders it impossible to chafe the necks of the horses; and by the lateral motion of the double-trees they so adjust themselves as to greatly assist the horses in turning the machine at the corners of the field. The side draft is controlled perfectly, and there is no jarring or jolting in the horses or machine. A faller swath can be cut and the machine is turned one-half easier. Any farmer can see the advantages of this center draft tongue without having them pointed out to him. The manufacturer is Jacob Keady, New Pittsburg, Wayne county, Ohio. He offers for sale the right for California.

WORK RESUMED IN THE COAL REGIONS.—Of the collieries owned by the Philadelphia and Reading coal and iron company, twenty have resumed work. Recent rains will interfere with work to a small extent for several days. In the vicinity of Shenandoah, all went to work except at the Kohinor and Turkey Run mines, where, because of a reduction of the contract work, some of the miners have struck.

No white man ever saw so much snow as there is now to be found in the Sierras.

Gems and Precious Stones.

(Written for the Press by HENRY G. HANKS.)

(Continued from last week.)

A.—Diamond, Jet and Cannel Coal.

The name diamond is a corruption of "adamas" or "adamant," derived from two Greek words, meaning "I conquer," referring to its excessive hardness.

The early history of the diamond is obscure. There seem to have been stones of quite different nature known to the ancients as "adamas." Pliny says: "Adamas is a mineral which for a long time was known to kings only, and to but few of them. The ancients supposed that adamas was only to be discovered in the mines of Ethiopia, between the temple of Mercury and the Island of Meroe, and they have informed us that it was never larger than a cucumber, or differed at all from it in color."

It is very certain that Pliny knew but little of the matter, for he describes six varieties, all of which, according to his description, possessed properties not found in the diamond, but he becomes absurd when he says that the diamond "which resists every force of nature, is made to yield before the blood of a he goat." To those who desire to verify this reaction he gives the following advice: "The blood, however, must be warm; the stone too, must be well steeped in it, and then subjected to repeated blows."

Allusions met with in ancient Hindu mythology lead to the supposition that they were in possession of gems and held them in high estimation.

According to Jewish history as set forth in the Bible the diamond was one of the 12 gems set in the breast-plate of the high priest. But to my surprise I find that Josephus denies this

Hydrabad and Masulipatam. Other localities in India have produced large quantities. It is said that Sultan Mahmood, when he died, left 400 pounds of diamonds. These diamond fields are now exhausted and seldom produce any stones of value.

Diamonds were discovered in Brazil in 1728. They had always been thrown aside as useless in gold washing, until one who had seen this gem in the rough state quietly collected a large quantity of them, from the sea of which, in Portugal, he realized a fortune.

They are found in an alluvial soil, in the district of Cerro di Fria, Minas Geraes, San Paulo and in other localities. Those Californians who have visited Rio Janeiro will remember the gorgeous display of diamonds in the shop windows—the product of these mines. It is said that Brazil has already produced two tons of diamonds.

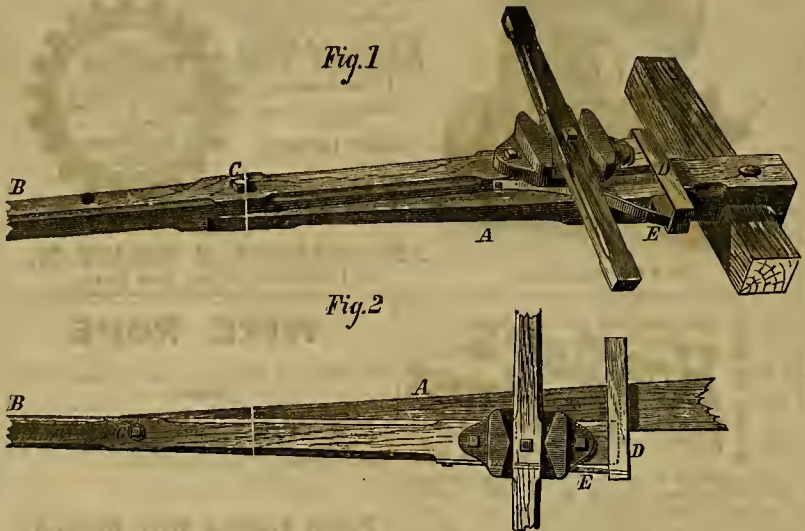
Only a few years ago the discovery of diamonds in Africa startled the world. It was thought that the price of these gems would be seriously affected by the quantities thrown on the market, but such was not the case. The African diamonds did not prove of fine quality.

When the Brazilian diamond fields were opened, it was not believed in England; but it was thought that the Indian diamonds had been sent to Brazil, and from thence sent to England.

The mines of Borneo have produced but few large diamonds, but great quantities of small ones. 2,000 carats is the amount of annual production credited to that island.

It is estimated that out of 10,000 diamonds only one will be found weighing 10 carats. Any diamond of this weight is called "princely."

There are only five diamonds which are rec-



CENTER DRAFT TONGUE FOR REAPERS AND MOWERS.

indirectly. As the discrepancy is remarkable I have given both:

BIBLE.	JOSEPHUS.
1 Sardius.	1 Sardonyx.
2 Topaz.	2 Topaz.
3 Carbuncle.	3 Emerald.
4 Emerald.	4 Carbuncle.
5 Sapphire.	5 Jasper.
6 Diamond.	6 Sapphire.
7 Ligure.	7 Ligure.
8 Agate.	8 Agate.
9 Amethyst.	9 Amethyst.
10 Beryl.	10 Chrysolite.
11 Onyx.	11 Onyx.
12 Jasper.	12 Beryl.

It will be seen that in the list given by Josephus that the arrangement is different, and that the chrysolite replaces the diamond. According to the Bible the diamond was one of the precious stones worn by the king of Tyre.

History shows that the ancients attributed great medicinal powers to gems. They were worn also as a protection against all forms of evil, some in a vague general way, while others were regarded as antagonistic to special diseases or accidents.

Pliny claims for the diamond that it will "overcome and neutralize poisons, dispel delirium and banish groundless perturbations of mind." Less than a century ago diamonds were borrowed from rich families to act as a cure for certain diseases. It is said that to prevent them being swallowed by the patient they were secured by a string when placed in the mouth.

Pinto and Pythagoras must have known something of gems and crystals, as they have beautifully written how "Nature in the dark recesses of the earth occupies her time in working out geometrical problems."

It is an historical fact that when during the French revolution the diamonds of the rich were given over to the people, it was found that many of them were imitation.

Until quite recently the chemical composition of the gems and crystals, as they have beautifully written how "Nature in the dark recesses of the earth occupies her time in working out geometrical problems."

As soon as its chemical nature was discovered attempts were made to produce it artificially in the laboratory, but up to the present day without success.

The first diamonds came from India. The famous mines of Golconda are situated between

ognized as "sovereigns," which will be mentioned hereafter.

There have been two panics in the price of diamonds: The first when it was known that Brazil was producing large quantities of this gem, and the other at the time of the French revolution. At these periods the prices of diamonds fluctuated in the strangest manner. The discovery of the African diamond fields did not cause any great fall in prices as was expected.

The first diamond was found in South Africa, in March, 1867. According to Prof. Tennant, 10 per cent. of the Cape diamonds are first-class, 15 per cent. second class, 20 per cent. of the third; the remainder being of the quality known as *borf*, and are useful only to cut other diamonds, and for glaziers' diamonds, rock drills, etc. According to the same authority, the Cape has already produced diamonds to the value of £12,000,000.

(To be Continued.)

THE MECHANICS' FAIR.—The Board of Managers of the Tenth Industrial Exhibition under the auspices of the Mechanics' Institute met Monday evening and adjourned *sine die*. Immediately after the adjournment the Board of Managers for the next exhibition organized by the election of the following named gentlemen: A. S. Hallidie, President; P. B. Cornwall, Vice-President; Henry L. Davis, Treasurer; J. H. Culver, Recording Secretary; James Spires, Corresponding Secretary; J. H. Gilmore, Superintendent; James C. Patrick, George Spaulding, D. E. Hays, H. S. Smith, James Drury, Asa R. Wells, Charles Eliot, J. B. Stetson, J. H. Stoutenborough and Jeremiah Browning. These gentlemen constituted the Board of last year, with the exception of Messrs Stetson and Drury, who were elected vice R. B. Woodward and W. P. Stont, resigned. The rules and regulations of the last fair were adopted. The board, in a preliminary announcement, state that the next exhibition will be opened at 11 o'clock A. M. on the 8th of August, and continue open at least one month thereafter. The management is specially anxious to have this year a good display of mineral products, and urge all interested in that branch of business to assist as far as possible.

There are no less than 10,000 men in the Black hills.

PATENTS & INVENTIONS.

A Weekly List of U. S. Patents Issued to Pacific Coast Inventors.

FROM OFFICIAL REPORTS FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.]

By Special Dispatch, Dated Washington, D. C., Mar. 28th, 1876.

FOR WEEK ENDING MARCH 14TH, 1876.

HYDRAULIC HOIST.—Samuel Ronuda, S. F., Cal.

NICKEL PLATING.—Camillo Maggio and Giuseppe Maffiella, S. F., Cal.

WINMILL.—John Brower, Perry D. Reed and Jasper P. Reed, Colusa, Cal.

ROTARY PLOWS.—William H. Foye, S. F., Cal.

STEAM BOILER FURNACES.—Michael Lufenberg, S. F., Cal.

PROPELLERS FOR VESSELS.—Thomas M. Rankin, Modesto, Cal.

REISSUE.

ELEVATOR.—Philip Hinkle, S. F., Cal.

TRADEMARK.

MUCILAGE.—Joshua Z. Dickson, S. F., Cal.

—The patents are not ready for delivery by the Patent Office until some 14 days after the date of issue. Note.—Copies of U. S. and Foreign Patents furnished by Dewey & Co., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

General News Items.

YELLOW FEVER is prevalent in Rio Janeiro. The Hudson river is still blocked up with ice.

RECENT storms in New England have caused great damage.

THE floods have destroyed a large portion of the crops in southern France.

THE sugar crop of Cuba will be \$30,000,000 less than that of last year.

THERE are 33 investigations under way before the Congressional committees.

WIFE heaters in California are now punished at the whipping post.

ELEVEN hundred new buildings were erected in the city last year.

PIPER, the Boston sexton, convicted of the murder of Mabel Young, has been sentenced to be hanged.

THE rinderpest has broken out in Japan among the cattle.

ACCORDING to Langley's new directory, we have a population of nearly 270,000 in San Francisco.

A STEAMSHIP load of articles for the Centennial from Rio Janeiro has arrived at Philadelphia.

A BILL has been signed by the Governor prohibiting fishing with nets, weirs or seines in the waters of San Antonio creek.

A WASHINGTON dispatch says the impeachment articles against Belknap will probably be reported to the House this week.

THE bill of Lane of Oregon to provide for paying the expenses of the Modoc war will give California \$44,000 and Oregon \$70,000.

THE German Minister has given notice by the termination of the existing treaty of commerce between his government and China.

CHARLES H. BARTH, transportation clerk in the Quartermaster's Department, U. S. A., in this city, is discovered to be a defaulter to the extent of \$67,000.

A DIFFICULTY between the American and Mexican soldiers at Brownsville and Matamoros a few days ago ended in the death of one of the former and two of the latter.

A MEMBER of the House Foreign Affairs Committee is reported as saying that the testimony already heard in relation to the Emma mine had convinced them that it was the most gigantic fraud of the century.

THE Committee appointed to consider the question of checking the immigration of Chinese to California propose to make the movement general by having the people of the interior towns unite in an expression of opinion on the subject by the passage of resolutions. These expressions will be used to the best advantage in applying for relief in the halls of Congress, where legislation will be asked for.

A SELENIUM WORKER.—Since we adopted the Willcox & Gibbs sewing machine for stitching the backs this paper (about two months ago) it has worked like a charm. We have stitched over 80,000 copies without breaking the first needle! But a single thread is used and that is fed from the original spool. This saves frequent threading of the needle and does away with all winding of thread. We run the machine by steam power because that power is most convenient in our office. It is one of the very easiest running machines, as it is one of the simplest. A child can operate it. They are very perfectly manufactured, not likely to get out of repair, and will last a lifetime. The new machine has points of excellence over all others. We advise those who wish a low-priced machine to address the general agent, E. B. Cutler, 111 Post street, San Francisco.

The Cause of Hard Times.

Different theories of the cause of the hard times have been advanced by different persons. In the *Unitarian Review* for January and February John O. Kimball offers the following, which is interesting reading, at least:

"It is due simply to the introduction, during the last 25 years, of such an enormous amount of machinery. There is nothing in our modern civilization which is more wonderful, more significant, more a new thing under the sun, and destined to be more wide-reaching in its relations, than this use of machinery. A single pegging machine will turn out more boots and shoes now than a whole village of cobblers at work in their little creaking shops fifty years ago. The cloth woven in any of our large mill towns is probably equal to half of what all India used to produce by the slow and methods of the middle ages. Steam engines alone are doing a work which without them would give employment to every one of the multitudes of men and women who are now lying idle in our country. California a few years ago was groaning over the introduction of so much 'Chinese cheap labor,' and yet, at that very time, most inconsistently, was giving a welcome to mowers and reapers and mining apparatus which for cheapness and facility of use made even a Chinaman dear. And then, when it is seen how these muscles and nerves of iron and steel are employed in every department of industry, from carving into shape a shaft of iron weighing 20 tons, down to the finishing of a cambric needle, and from the sewing of a buttonhole to the sowing and reaping of whole States, who can wonder that the market is overstocked?"

"Of course this increase of facilities for doing work increased for a while the amount of work to be done. But such a process could not go on forever. There was a limit even to the number of stitches which could be put into a lady's dress, and to the amount of wheat which even an American family could make way with. And this point has at last been reached. The occurrence of our civil war, with its enormous destruction of property, and its withdrawal of energies into the battle field, put off the day; but the end of the war, and their return again into the pursuits of peace, soon filled up the gap, and brought us to the point where it was hardly possible to consume a half of what was being produced—the point, therefore, where business was obliged to stop."

J. H. CULVER, Secretary of the board of managers of the Mechanics' fair, has been commissioned to visit Philadelphia this year, and do all that is possible to add to the attractions of the fair this year by securing interesting exhibits from the East and Europe.

Banking.

The Merchants' Exchange Bank
OF SAN FRANCISCO.

Capital, Five Million Dollars.

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Business Directory.

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HALE, PAGE & WILSON,
Commission Stock Brokers, 429 California Street, S. F.
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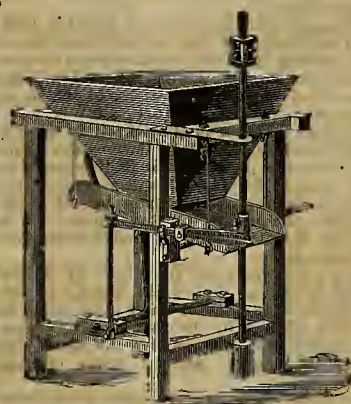
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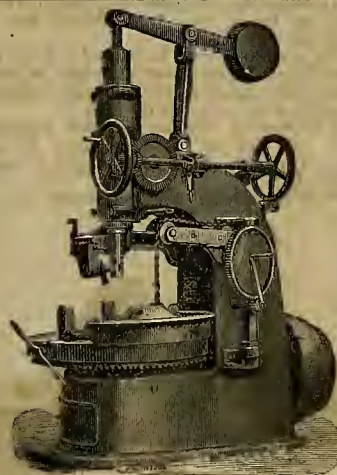
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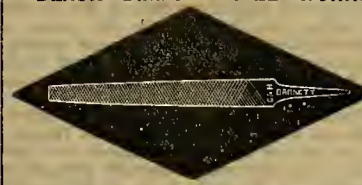
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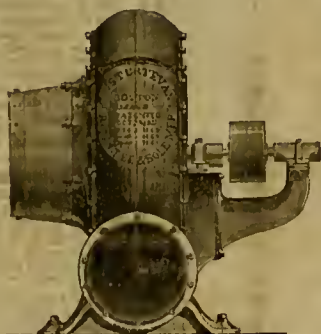
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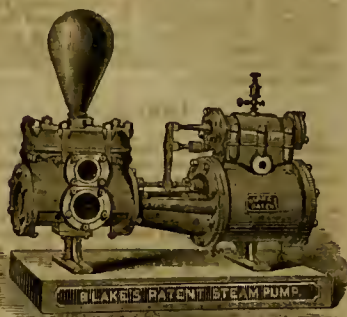
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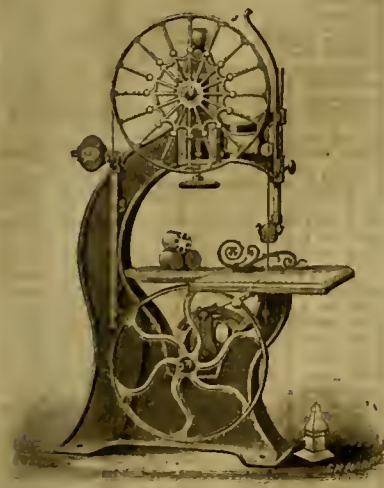
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of all kinds.

BLAKE'S PATENT STEAM PUMP



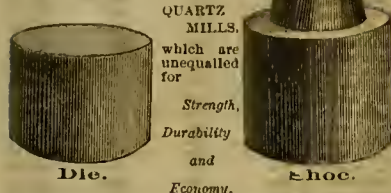
Over 8,500 in Successful Use in the United
States.



Machinery.

STEEL SHOES AND DIES FOR QUARTZ MILLS.

Made by our improved pro-
cess. After many years of
patient research and experiment
we have succeeded in producing
STEEL SHOES AND DIES for



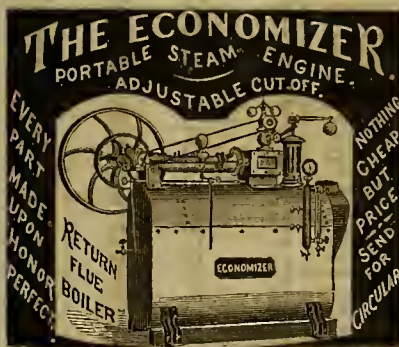
Will wear three times longer than any iron shoes.

BUILDERS AND CONTRACTORS

Of Quartz Mills, Pans, Separators, Concentrators, Jigs,
Hydraulic Rock Breakers, Furnaces, Engines, Boilers
and Shuttling, and General Mining Machinery in all its
details, and Furnishers of Mining Supplies.
All orders promptly filled.

MOREY & SPERRY,
88 Liberty street, N. Y.

Examination solicited.



Cotton Gins, Printers, Cheese Makers,
Laundries, Cabinet Makers, and All
Manufacturing where Light
Power is Required.

A. L. FISH & CO.,

Sole Agents for California,
9 and 11 First Street, San Francisco.



STEAM ENGINES & BOILERS

From 3 to 75-horse power. Shafting, Pulleys, Hoist Gears
Quartz Mills, Water Tanks, Spanish Arasras, Pumpe and
Pipes, Hepburn and Belden Pans, and all kinds of Ma-
chinery for sale at lowest prices by

THOS. P. H. WHITELAW,

256 Brannan street, S. F.

Highest cash prices paid for all kinds of Machinery.

THORNE, DeHAVEN & CO.

21st Street, above Market,
PHILADELPHIA.

DRILLING MACHINES.

PORTABLE DRILLS. Driven by power in any
direction, self-feed and convenient adjustment.

RADIAL DRILLS. Self-feed—large adjustable
box table—separate base plate, every convenience.

VERTICAL DRILLS. Self-feeding—of new and
improved designs.

MULTIPLE DRILLS. For boiler work, etc., 2 to
20 spindles, fed and returned by power or hand,
together or separately.

HORIZONTAL BORING AND DRILLING
MACHINES. For large pieces—with boring head,
adjustable, vertically and horizontally.

SPECIAL DRILLS. For special work. Gun Blank
Drills, Coal Drills, &c., built to order.



CANDLES.

MITCHELL'S

New York Candles

Full Weight and 14 ounce.

Will be found on comparison to be

Unequaled in Quality.

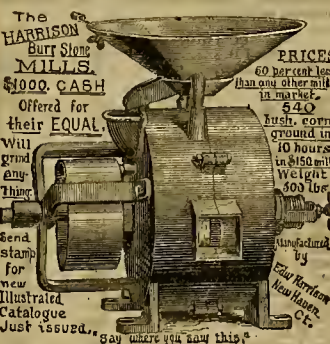
14 GMG OZ.

STEARIC ACID
CANDLES

GEO. M. GRANT & CO.
PHILADELPHIA.

FOR SALE BY ALL THE LEADING JOBBERS.

Geo. M. Grant & Co., Agents. San Francisco.

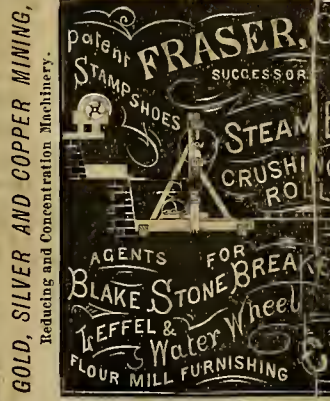


G. W. & C. A. LANE, Exeter, N. H., write, Dec. 13:

"We started the heavy 20-inch Corn Mill last Friday you
sent to Baldwin & Tabor, Manchester, N. H. We ran it most
all day, and ground 60 bushels corn per hour. The mill you
sent us at Haverhill, Mass., for A. S. Hook, is doing wonder-
fully. It is grinding on an average 2,600 lbs. good meal per
hour, and has ground 2,800 lbs. in an hour. It is driven by an
engine with a 9-in. cylinder, and takes the place of a 30-in.
mill of another kind that, when doing its best and loading
the engine with all it could carry, only ground 1,500 lbs. per
hour. If there is a mill built that can beat that we would be
pleased to see it brought out."

The HARRISON
Burr Stone
MILLS.
\$1000. CASH
Offered for
their EQUAL.
Will
grind
any
thing
Send
stamp
for
new
Illustrated
Catalogue.
Just issued.

say where you saw this.



The Ingersoll Rock-Drill



Is Extensively Used in the East and

TAKES THE PLACE OF ALL OTHERS,

Wherever introduced, because it can be run with less
power, labor and repairs, and do more work than any
other Drill in the market. It has but few parts, is easi-
ly handled, being light, and HAS AUTOMATIC FEED,
which saves labor. WE ASK FOR TRIAL AGAINST
ANY COMPETITOR. For particular information re-
garding Drills or Air Compressors, send for circular to

J. B. REYNOLDS,

Room 1, 315 California Street

Buffalo Excelsior Pony Planer & Matcher.



Patented March 30, 1875.

Excelsior

LATEST IMPROVEMENT.



Scroll Saw.

Saw only without attachments, \$9.

Best of its kind in use

Price, complete, \$275. A
small Pony Planer and
Matcher Machine
Knives, which are re-
commended as superior
and extra in quality. 100
borell work designs free
on receipt of stamp. For
circulars giving detailed
information, address
GEO. PARR, Buffalo, N. Y.

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Nearly One Thousand in Use.

BUFFALO PONY PLANNER

Will earn itself and pay expenses of
running in 8 days. Price from
\$3.00 upwards, each. Also, small
Pony Planer and Matcher, and
Planing Machine Knives. Rec-
ommended as superior and extra
quality. Circulars free. One
hundred Scroll designs free on
receipt of stamp. Address
GEO. PARR, Buffalo, N. Y.

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DUNHAM, GARDIGAN & Co., San Francisco, are Sole
Agents in California for my Heavy Wood Working
Machinery.

Barnes' Patent Foot and Steam Power Scroll Saws and Lathes.



For the entire range of Scroll Sawing
from the finest ornament to the coarse
bracket, three inches thick.

WARRANTY.—We guarantee that a
man with ordinary experience can,
with this Foot Power Machine, saw
through the following kinds of lumber
line measure: Pine, 3 in. thick, 1 foot
per minute; 1 in. thick, 4 ft. per min.;
Walnut, 3 in. thick, 1/2 ft. per min.;
1 in. thick, 2 ft. per min. Address for
full particulars, W. P. & JOHN
BARNES, Rockford, Winnebago Co., Illinois.

BARNES, Rockford, Winnebago Co., Illinois.

SAN FRANCISCO

Pioneer Screen Works,

Removed to 32 Fremont Street, near Market.

J. W. QUICK,



Manufacturer of perforated
sheet metals of every descrip-
tion, at reduced rates. For
owners using Battery Screens
extensively, can contract for
large supplies at favorable rates.
This is the only establishment
on the Coast devoted exclusively
to the manufacture of screens

(Continued from Page 214.)

Arizona.

GLOBE DISTRICT.—Cor. Arizona *Citizen*: Excitement has run high during the past week throughout this whole district, owing to the discovery made by John Alvane, on the northeast slope of the northwest peak of the Apache mountains, about six miles north of here. The vein struck in this discovery is looking very well as far as developed, and has been named the Richmond. Several arrivals from Silver City, Phoenix and Prescott, within a week, have increased our numbers here to 200, certainly, and the cry is still they come. The shaft of the Richmond is now down 37 feet, and the character of the formation improves daily and is very encouraging.

Idaho.

ROCKY BAR.—Cor. Idaho *Avalanche*, March 18: The Buffalo company have extended their lower tunnel across their Atlanta ledge, some 60 feet, and about two weeks ago they struck a fine pay streak near the south wall, which measures three feet 10 inches in width, and assays from \$75 to \$300 and over per ton. This streak is improving as they go west, and they are now getting out both ruby and brittle silver in abundance, which they are sacking for shipment. While at Red Warrior, the other day, I visited the Burnt Pilot mine, owned by Messrs. Hicks & Porter. They have labored diligently this winter, having sunk a shaft 50 feet on their vein, and then drifted east on it from the bottom of the shaft a distance of 30 feet. This drift will be extended 20 feet further, when they will commence stopping. By running about 50 feet further they will strike their ledge at a depth of 270 feet, and will then have open one of the best gold producing mines in the camp, and which is bound to yield them a handsome stake. There is nothing new to note in regard to other mining operations since my last report. The above are but instances of what can be accomplished here by energetic, hard working men. Any amount of mine can be got hold of by men who are not afraid to use their muscle; there is room here for all, if they will only come.

WOODWARD'S GARDENS embraces an Aqueduct, Museum, Art Gallery, Conservatories, Tropical Houses, Menagerie, Seal Ponds and Skating Rink.

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

California Acclimatizing Society—Location of principal place of business, San Francisco, Cal.

Notice.—There are delinquent upon the following described stock, on account of assessment (No. 6), levied on the ninth day of February, 1876, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Anthony, T. E.	17	1	\$ 50
Anthony, T. E.	250	9	4 50
Bach, John	14	1	50
Bach, John	225	24	12 00
Banyong, O. W.	24	1	50
Banyong, O. W.	208	24	12 00
Bigelow, J. E.	512	5	2 50
Belamere, A.	112	1	50
Belamere, A.	251	24	12 00
Budd, W. O.	986	5	2 50
Bretter, W. O.	986	5	2 50
Brumman, J. J.	192	1	50
Brumman, J. J.	330	24	12 00
Bosqui, E.	617	10	5 00
Butler, F. S.	823	10	5 00
Boswell, S. B.	869	25	12 50
Britton, Jos.	784	10	5 00
Bryant, J. M.	898	5	2 50
Baron, P.	927	10	5 00
Brewer, W.	796	1	50
Badlam, Alex.	20	1	50
Burgess, O. C.	64	1	50
Burton, T.	129	1	50
Clark, S. B.	171	1	50
Clark, S. B.	172	1	50
Clark, S. B.	928	5	2 50
Clark, S. B.	927	5	2 50
Clark, S. B.	928	5	2 50
Clark, S. B.	929	5	2 50
Clark, S. B.	930	5	2 50
Clark, S. B.	931	5	2 50
Clark, S. B.	932	5	2 50
Clark, S. B.	933	5	2 50
Clark, S. B.	934	5	2 50
Clark, S. B.	935	5	2 50
Clark, S. B.	936	5	2 50
Clark, S. B.	937	5	2 50
Clark, S. B.	938	5	2 50
Clark, S. B.	940	5	2 50
Clark, S. B.	941	5	2 50
Clark, S. B.	942	5	2 50
Clark, S. B.	943	5	2 50
Clark, S. B.	944	5	2 50
Clark, S. B.	945	5	2 50
Clark, S. B.	946	5	2 50
Clark, S. B.	947	5	2 50
Clark, S. B.	948	5	2 50
Clark, S. B.	949	5	2 50
Clark, S. B.	950	5	2 50
Clark, S. B.	951	5	2 50
Clark, S. B.	952	5	2 50
Clark, S. B.	953	5	2 50
Clark, S. B.	954	5	2 50
Clark, S. B.	955	5	2 50
Clark, S. B.	956	5	2 50
Clark, S. B.	957	5	2 50
Clark, S. B.	958	5	2 50
Clark, S. B.	959	5	2 50
Clark, S. B.	960	5	2 50
Clark, S. B.	961	5	2 50
Clark, S. B.	962	5	2 50
Clark, S. B.	963	5	2 50
Clark, S. B.	964	5	2 50
Clark, S. B.	965	5	2 50
Clark, S. B.	966	5	2 50
Clark, S. B.	967	5	2 50
Clark, S. B.	968	5	2 50
Clark, S. B.	969	5	2 50
Clark, S. B.	970	5	2 50
Clark, S. B.	971	5	2 50
Clark, S. B.	972	5	2 50
Clark, S. B.	973	5	2 50
Clark, S. B.	974	5	2 50
Clark, S. B.	975	5	2 50
Clark, S. B.	976	5	2 50
Clark, S. B.	977	5	2 50
Clark, S. B.	978	5	2 50
Clark, S. B.	979	5	2 50
Clark, S. B.	980	5	2 50
Clark, S. B.	981	5	2 50
Clark, S. B.	982	5	2 50
Clark, S. B.	983	5	2 50
Clark, S. B.	984	5	2 50
Clark, S. B.	985	5	2 50
Clark, S. B.	986	5	2 50
Clark, S. B.	987	5	2 50
Clark, S. B.	988	5	2 50
Clark, S. B.	989	5	2 50
Clark, S. B.	990	5	2 50
Clark, S. B.	991	5	2 50
Clark, S. B.	992	5	2 50
Clark, S. B.	993	5	2 50
Clark, S. B.	994	5	2 50
Clark, S. B.	995	5	2 50
Clark, S. B.	996	5	2 50
Clark, S. B.	997	5	2 50
Clark, S. B.	998	5	2 50
Clark, S. B.	999	5	2 50
Clark, S. B.	1000	5	2 50

Names.	No. Certificate.	No. Shares.	Amount.
Harris, S. R.	755	1	50
Hynes, A. R.	714	3	1 50
Jordan, D.	111	1	50
Jordan, D.	145	1	50
Jordan, D.	324	28	14 00
Jones, S. L.	889	10	5 00
Joice, E.	227	1	50
Joice, E.	227	1	50
Josselyn, O.	708	25	12 50
Jackson, D. B.	868	5	2 50
Jordan, G. L.	373	1	50
Jordan, M. C.	794	1	50
Jordan, M. C.	795	1	50
Kimball, G. P.	84	1	50
Kimball, G. P.	318	1	50
Koster, A.	104	1	50
Koster, A.	343	22	11 00
Koster, A.	444	2	1 00
King, J. F.	57	1	50
King, J. F.	245	24	12 00
Kerr, S. R.	801	3	1 50
Larkins & Spósito.	1018	250	125 00
Loche, J. F.	179	1	50
Loche, J. F.	196	15	7 50
Loche, J. F.	618	17	8 50
Lee, S. W.	974	5	2 50
Laycock, E. H.	1041	5	2 50
Laycock, E. H.	1049	5	2 50
Laycock, E. H.	1055	5	2 50
Laycock, E. H.	1079	25	12 50
Laycock, E. H.	1080	25	12 50
Laycock, E. H.	1081	25	12 50
Laycock, E. H.	1082	25	12 50
Laycock, E. H.	1083	25	12 50
Laycock, E. H.	1084	25	12 50
Laycock, E. H.	1085	25	12 50
Laycock, E. H.	1086	25	12 50
Laycock, E. H.	1087	25	12 50
Laycock, E. H.	1088	25	12 50
Laycock, E. H.	1089	25	12 50
Laycock, E. H.	1090	25	12 50
Laycock, E. H.	1091	25	12 50
Laycock, E. H.	1092	25	12 50
Laycock, E. H.	1093	25	12 50
Laycock, E. H.	1094	25	12 50
Laycock, E. H.	1095	25	12 50
Merrill, O. R.	387	24	12 00
Merrill, O. R.	552	27	13 50
Mason, Chas.	413	25	12 50
McGovern, P.	21	1	50
McGovern, P.	230	24	12 00
McGovern, P.	884	2	1 00
Mason, John	52	1	50
Mason, John	380	24	12 00
Mallard, A.	78	1	50
Mallard, A.	200	24	12 00
McKenzie, A.	96	1	50
McKenzie, A.	282	24	12 00
Marriott, F.	659	5	2 50
McClennan, D.	704	25	12 50
Mack, J. G.	978	5	2 50
Meyer, E. Leiman.	983	5	2 50
Metzger, W. A.	1005	5	2 50
Maas, Jos.	1032	5	2 50
McIntosh, R.	762	1	50
Newell, W. A.	488	1	50
Newell, W. A.	754	5	2 50
Newell, Walter	730	10	5 00
Newell, Walter	731	27	13 50
Newell, Walter	769	5	2 50
Nelson, H. W.	850	5	2 50
Ogden, R. L.	83	1	50
Ogden, R. L.	317	24	12 00
Orr, J. K.	61	1	50
Orr, J. K.	886	4	2 00
Osgood, Chas. E.	635	1	50
Osgood, E. J.	637	1	50
Osgood, A. G.	638	1	50
Osburn, G.	454	2	1 00
Platt, H. B.	303	24	12 00
Porter, Horace	38	1	50
Porter, Horace	264	24	12 00
Pritchard, James A.	606	25	12 50
Piper, W. A.	923	5	2 50
Pateman, Robert	923	5	2 50
Peterson, R.	969	5	2 50
Poor, F. A.	947	1	50
Quay, J. M.	924	5	2 50
Keas, F.	28	1	50
Read, F.	394	24	12 00
Bedding, B. B.	554	5	2 50
Bedding, W. S.	855	5	2 50
Reilly, Thos.	645	1	50
Reilly, Thos.	645	1	50
Reynolds, L. G.	1027	5	2 50
Springer, Jason.	10	1	50
Springer, Jason.	406	24	12 00
Swain, A. E.	36	1	50
Swain, A. E.	844	16	8 00
Swain, A. E.	1007	5	2 50
Swain, A. E.	1008	5	2 50
Swain, A. E.	1009	5	2 50
Swain, A. E.	1011	10	5 00
Swain, A. E.	1013	4	2 00
Swain, A. E.	1023	5	2 50
Swain, A. E.	1026	7	3 50
Smith, A. D.	145	1	50
Smith, A. D.	18	12	6 00
Stivers, H. F.	357	24	12 00
Stark, B. S.	394	24	12 00
Swan, B. E.	583	5	2 50
Swan, B. E.	594	5	2 50
Swan, B. E.	595	5	2 50
Swan, B. E.	596	5	2 50
Sylvester, L. G.	513	1	50
Sylvester, L. G.	523	5	2 50
Sage, R. M.	620	10	5 00
Shattuck, B. F.	72	25	12 50
Staphens, D.	723	30	15 00
Stanford, D. E.	805	10	5 00
Sharky, J. M.	820	5	2 50
Swett, P.	757	1	50
Shattuck, W. D.	29	1	50
Spaulding, O. L. A.	445	1	50
Toland, C. G.	46	1	50
Toland, O. G.	250	2	1 00
Traylor, W. W.	887	12	6 00
Traylor, W. W.	631	25	12 50
Traylor, W. W.	632	20	10 00
Flandron, H. H.	641	8	4 00
Thayer, Edward	922	5	2 50
Usher, J. Clem.	624	10	5 00
VanComt, John	32	1	50
VanComt, John	307	24	12 00
Videau, Henry	170	5	2 50
Videau, Henry	263	24	12 00
Van Vlack, C. J.	785	1	50
Wright, B. F.	662	13	6 50
Williamson, John	215	25	12 50
Williamson, John	457	5	2 50
Williamson, John	458	5	2 50
Williamson, John	459	5	2 50
Williamson, John	461	5	2 50
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Williamson, John	497	5	2 50
Williamson, John	498	5	2 50
Williamson, John	499	5	2 50
Williamson, John	500	5	2 50
Woodward, R. B.	210	24	12 00

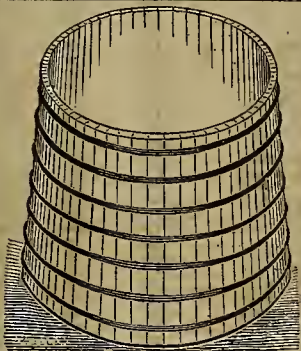
Names.	No. Certificate.	No. Shares.	Amount.
Wagner, John	450	10	5 00
Wagner, John	635	5	2 50
Watthell, J. V.	887	10	5 00
Watthell, J. V.	592	10	5 00
Wagner, R.	754	25	12 50
Wilson, H. A.	847	5	2 50
Welch, F. R.	822	1	50
Yale, G. G.	802	10	5 00
Zeigler, J. L.	412	25	12 50
Zeigler, Wm.	724	25	12 50

No. Certificate. No. Shares. Amt.				No. Certificate. No. Shares. Amount.				No. Certificate. No. Shares. Amount.				No. Certificate. No. Shares. Amount.			
Rathborne, R Wm.	261	100	100 00	Van Schaick & Co.	unissued	100	100 00	Gleott, Horatio L.	207	100	100 00	Wall, Henry	245	100	100 00
Rathborne, R Wm.	262	100	100 00	Van Schaick & Co.	unissued	100	100 00	Gleott, Horatio L.	208	100	100 00	Wall, Henry	246	100	100 00
Rathborne, R Wm.	263	100	100 00	Van Schaick & Co.	59	100	100 00	Gleott, Horatio L.	209	100	100 00	Wall, Henry	247	100	100 00
Rathborne, R Wm.	264	100	100 00	Van Schaick & Co.	70	100	100 00	Gleott, Horatio L.	210	100	100 00	Wall, Henry	248	100	100 00
Rathborne, R Wm.	265	100	100 00	Van Schaick & Co.	71	100	100 00	Gleott, Horatio L.	211	100	100 00	Wall, Henry	249	100	100 00
Rathborne, R Wm.	266	100	100 00	White, Morris & Co.	unissued	850	850 00	Gleott, Horatio L.	212	100	100 00	Wall, Henry	250	100	100 00
Rathborne, R Wm.	267	100	100 00	Weed, Edmund H.	unissued	200	200 00	Gleott, Horatio L.	214	100	100 00	Wall, Henry	251	100	100 00
Rathborne, R Wm.	268	100	100 00	Wollberg & Co.	unissued	400	400 00	Gleott, Horatio L.	454	63	63 00	Wall, Henry	252	100	100 00
Rathborne, R Wm.	269	100	100 00	Wallace, F. B.	unissued	35	35 00	Paton, Thomas	unissued	232	232 00	Wall, Henry	253	100	100 00
Rathborne, R Wm.	270	100	100 00	Weeks, W. A.	unissued	3398	3398 00	Paton, W. D. Jr.	unissued	20	20 00	Wall, Henry	254	100	100 00
Rathborne, R Wm.	271	100	100 00	Woodman, Cyrus	unissued	100	100 00	Paton, W. D. Jr.	unissued	67	67 00	Wall, Henry	255	100	100 00
Rathborne, R Wm.	272	100	100 00	Watson, A. W.	467	10	10 00	Paton, W. D. Jr.	unissued	20	20 00	Wall, Henry	256	100	100 00
Rathborne, R Wm.	273	100	100 00	Watson, A. W.	468	15	15 00	Paton, W. D. Jr.	unissued	67	67 00	Wall, Henry	257	100	100 00
Rathborne, R Wm.	274	100	100 00					Rose, W. W.	40	100	100 00	Wall, Henry	258	100	100 00
Rathborne, R Wm.	275	100	100 00					Rose, W. W.	41	100	100 00	Wall, Henry	259	100	100 00
Rathborne, R Wm.	276	100	100 00					Rose, W. W.	42	100	100 00	Wall, Henry	260	100	100 00
Rathborne, R Wm.	277	100	100 00					Rose, W. W.	43	100	100 00	Wall, Henry	261	100	100 00
Rathborne, R Wm.	278	100	100 00					Rose, W. W.	44	100	100 00	Wall, Henry	262	100	100 00
Rathborne, R Wm.	279	100	100 00					Rose, W. W.	45	100	100 00	Wall, Henry	263	100	100 00
Rathborne, R Wm.	280	100	100 00					Rose, W. W.	46	100	100 00	Wall, Henry	264	100	100 00
Rathborne, R Wm.	281	100	100 00					Rose, W. W.	47	100	100 00	Wall, Henry	265	100	100 00
Rathborne, R Wm.	282	100	100 00					Rose, W. W.	48	100	100 00	Wall, Henry	266	100	100 00
Rathborne, R Wm.	283	100	100 00					Rose, W. W.	49	100	100 00	Wall, Henry	267	100	100 00
Rathborne, R Wm.	284	100	100 00					Rose, W. W.	50	100	100 00	Wall, Henry	268	100	100 00
Rathborne, R Wm.	285	100	100 00					Rose, W. W.	51	100	100 00	Wall, Henry	269	100	100 00
Rathborne, R Wm.	286	100	100 00					Rose, W. W.	52	100	100 00	Wall, Henry	270	100	100 00
Rathborne, R Wm.	287	100	100 00					Rose, W. W.	53	100	100 00	Wall, Henry	271	100	100 00
Rathborne, R Wm.	288	100	100 00					Rose, W. W.	54	100	100 00	Wall, Henry	272	100	100 00
Rathborne, R Wm.	289	100	100 00					Rose, W. W.	55	100	100 00	Wall, Henry	273	100	1

Pancake Coal Mine.

A gentlemen just in from the Pancake company's coal mines, informs us that two stratas of coal have been struck in the new double shaft that the company have been for several months past engaged in sinking, which is now down to a depth of 225 feet. The first strata was struck at a depth of 190 feet, and is 15 inches in width. The second was struck at a depth of 200 feet, and is three and a half feet in width; in the deepest strata the coal is of a very superior quality. After going through the two stratas of coal a short distance a body of water was struck, which will require a little delay in putting in a pump, and will also incur the time and expense of getting a boiler of larger capacity than the one now in use. This, we understand, is to be done immediately. As soon as work can be resumed, proper levels will be run to extract the veins of coal that have recently been struck, and the sinking of the main shaft will also be continued to strike other stratas that are known to exist at a greater depth. Those at all familiar with the workings of this mine will remember that a large amount of work has been done that was impractical, but not entirely thrown away, as, while being done, several veins of coal were discovered and their courses ascertained. The present company being in possession of all these facts, concluded to sink a double shaft and put up extensive hoisting works, and located the new shaft with a view to cut the veins that had been developed by the old workings, which they have succeeded most admirably in doing. The recent strikes have fully developed a continuous series of coal veins, which will be largely worked during the coming summer. We are also informed that it is the intention of the company to erect extensive works at Enreka for the manufacture of coke, to be used by the numerous smelting furnaces at this place. There is little doubt but coke can be manufactured there cheaper than it can be freighted from the East, and allow the company a fair profit for their coal and its manufactures. It is now an established fact that we have extensive coal beds in White Pine county, which will prove quite as remunerative as any silver mines in the State. We congratulate the company on their new find.—*White Pine News.*

On the Ophir mine the excavations for the pumping machinery are rapidly nearing completion. The tar-house having been destroyed by fire a few days ago, it is being rebuilt on the east side of the railroad track, so as not to again endanger the main buildings. No fire will be used in the house after this, as the tar will be heated by steam, conveyed in pipes from the boilers. This is a vast improvement over the old style of heating the tar by a fire, and is well worth copying after by every mine on the line of the Comstock.



WATER TANKS of any capacity, made entirely by machinery. Material the best in use; construction not excelled. Attention, dispatch, satisfaction. Cost less than elsewhere.

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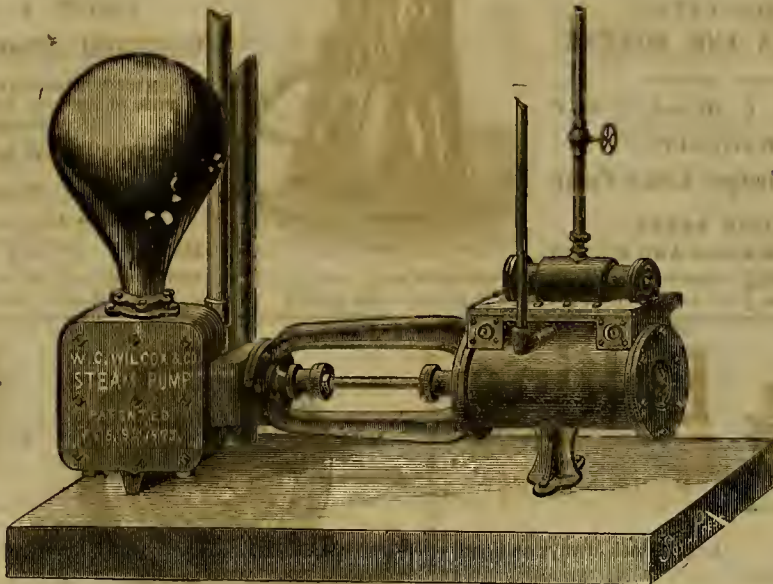
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A PAINT FOR FARMERS.—Prof. J. B. Turner, Jacksonville, Ill., is a man of great practical knowledge and experience; hence, we attach a great deal of value to the following, from his pen, which we find in the *Prairie Farmer*:

"Some two years ago I sent for and got from a barrel to a barrel and a half of Averill Chemical Paint, of light dun color, which I thought would suit me well enough for all work—houses, doors, blinds, fences, bee-hives, wagons, tools and all. I put two coats upon my residence here, and run over three or four of my smaller farm houses on my farms. With what was left I painted my bee-hives, wagons, wheelbarrows, rollers, harrows, fences, etc., etc., and on all these buildings, implements, tools, gates, etc., the paint is as hard and glossy to-day, so far as I can see, as it was a month after it was put on, and holds fair to hold its own at least for five years to come, (if not ten of them,) better than ordinary white lead and oil does for even two years.

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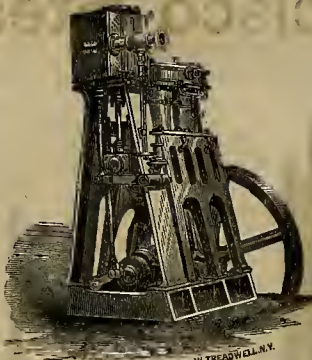
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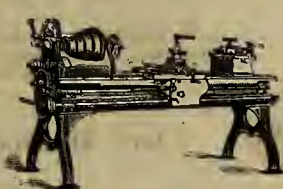
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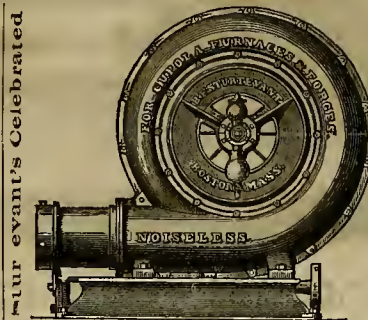
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Eureka Stone Manufacturing Company—A Stockholders' Meeting of the above-named company for the election of Directors for the ensuing year, and for the transaction of such other business as may come before the meeting, will be held at the company's office, No. 207 Sansome street, San Francisco, on Tuesday, the eleventh day of April, 1876, at 11 o'clock, A. M. WILLIAM HOOD, President. P. D. MOWELL, Secretary.

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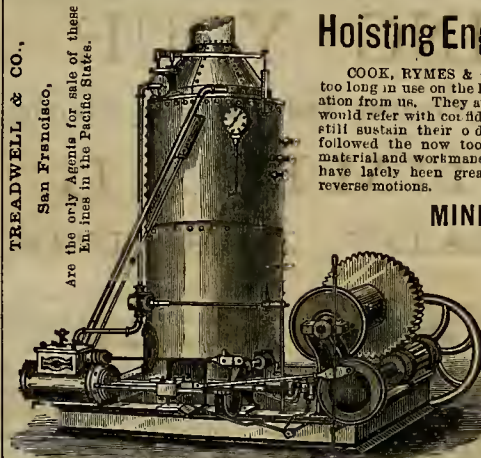
NOTICE.

All persons are notified not to purchase any interest in the Dry Washer for which J. J. Cruikshank filed a caveat on the twelfth day of February, 1876, as I am the inventor and have applied for a patent.

GEORGE GINN.

Belmont, Nevada, March 19th, 1876.

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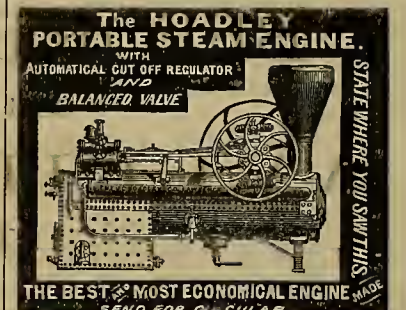
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CALIFORNIA THEATER, Bush Street, above Kearney. Open every evening with the best Dramatic Company in the United States. Box office open from 9 A. M. to 10 P. M. Seats may be secured six days in advance. Doors open at half past seven; Commence at eight o'clock. Monday, March 27, 1876, JOHN McCULLOUGH.

MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO.,
Patent Solicitors.

SAN FRANCISCO, SATURDAY, APRIL 8, 1876.

VOLUME XXIII
Number 15.

Allen's Fracture Bed.

We illustrate on this page a surgical bedstead, the invention of Oliver Allen, of Petaluma, which is constructed in such a manner as to be of great assistance to both the surgeon and the patient in cases of fractured limbs, and which has many new features to recommend it. We examined carefully last week one of these beds in the surgical ward at the City and County hospital, and although a detailed description of it may make it appear a complicated affair, a little study of its construction from the engraving presented will show that its general features are quite simple. Upon it fractures can be cured without shortening of

spite of our best efforts there always will be some shortening," and "if a case results in but half an inch shortening it is a good cure."

The "fracture bed" and its appliances compose an apparatus which is the result on the part of the inventor of an effort to make something durable, convenient and satisfactory to both patient and surgeon, and in which any forms of fracture in either limb or limbs of any length, a perfect tension may be kept up with little discomfort, a perfect dressing may be quickly effected, and in which after dressing require no removing of appliances, or the least disturbance of the fractured parts. These results are practically attained; in addition to which the surgeon cannot fail to feel perfectly secure and the patient comparatively comfortable. The apparatus is really simple and is adapted to many purposes by purely mechanical arrangement.

horizontal flange, and this flange is upholstered so that it will form a soft cushion.

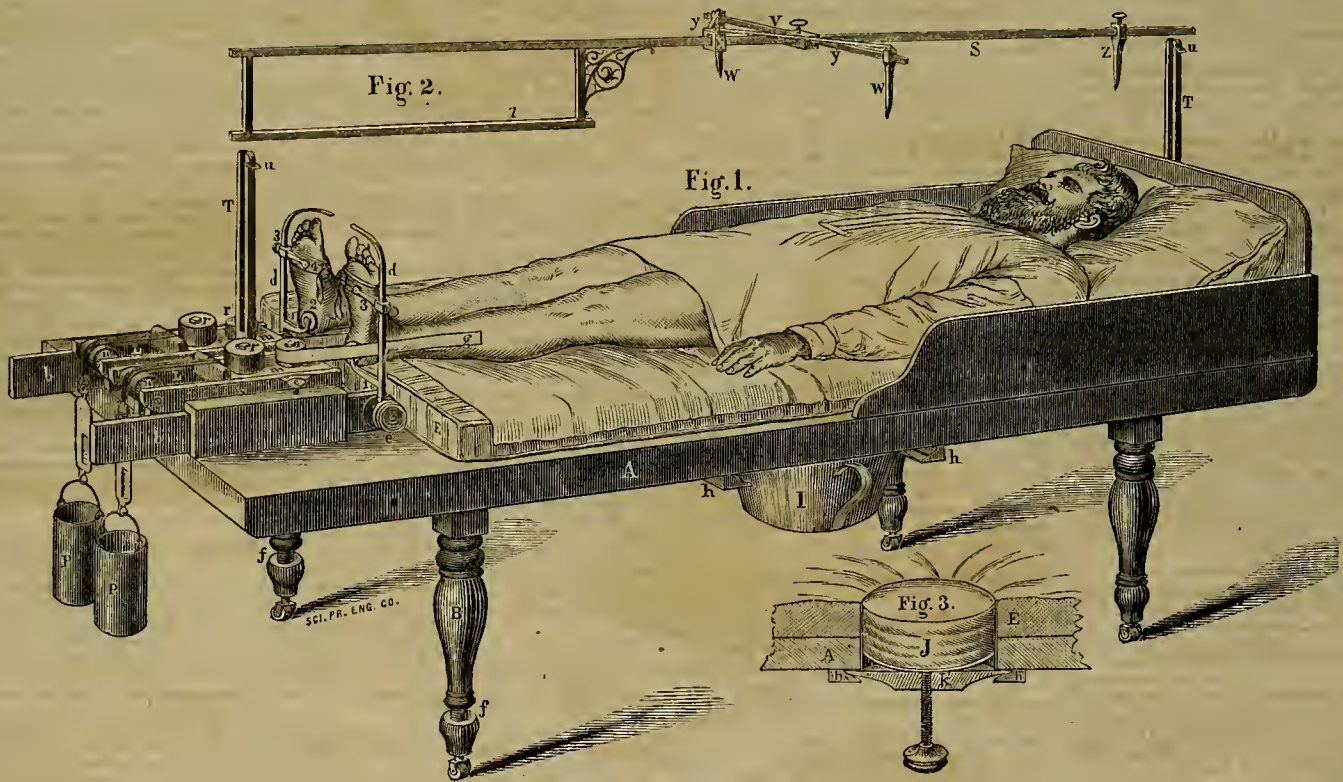
A space is also left around the metal lining of the mattress, so that when the mattress is pressed down the upward projecting flange of the hole in the bed bottom will enter the space and allow the mattress to be compressed.

Underneath the bed are secured two transverse rails, *h h*, one on each side of the hole. The inner edges of these rails are grooved so as to receive the opposite flanges of a pan or chamber vessel, *I*, and allow the vessel to be moved along underneath the bed until directly under the hole. When the vessel is not in use an upholstered plug, *J*, for filling the hole is employed. This plug is long enough to be passed up into the hole from beneath the bed, *A*, and extend to the upper part of the mattress, *E*, and make an even surface. To the lower end of the plug is secured on a

be too short when the fracture heals.

In order to adjust the patient properly for the purpose of obtaining a correct extension the inventor uses a measuring bar, *S*, (Fig. 2), which is supported at each end by a standard, *T*, at the middle of each end of the bed, so that the bar, *S*, will pass longitudinally above the middle of the bed and the patient. The standards, *T*, are made of two parallel pieces of wood, between which the ends of the bar, *S*, are placed and adjusted to any desired height. A link, *u*, at the top of the standard, is then used to draw the two parts together to keep the bar in place. Upon the bar, *S*, is placed a transverse sliding bar, *V*, the arms of which project upon each side of the bar, *S*. A set screw serves to fix the transverse bar in place.

Upon each arm of this bar, *V*, is placed a downward projecting sliding finger, *W*, and these sliding fingers are connected with a slid-



ALLEN'S FRACTURE BED WITH APPLIANCES.

the limb, while the patient is kept comparatively comfortable and all his wants supplied without disturbing his position. A fractured leg or thigh, especially if it be compound, is surely a matter of too much importance to both surgeon and patient to submit it to packing in a hot fracture box, or lashing it to a strip of board with the padding necessary to make it endurable, and which, for the purpose of inspection, requires such manipulation that the fractured bone will be jostled about, and any efforts at reparation thus interfered with. The ability to examine any part of the injured limb at any time without its disturbance, and without interfering with the extension, is certainly very important, and perfect control of the positions of the foot is equally desirable, both of which are secured in this appliance.

It is certain, moreover, that the surgeon must have both limbs extended alike, and have a more accurate method of measuring than the old one before he can be certain he is not deceiving himself in measurement. It is stated that the difference in length between a limb in its extended and unextended condition is about half an inch—sometimes more, sometimes less—as any one can easily convince himself. It is at least probable that this error in measurement, and the heretofore imperfect manner of measurement, are the two principal reasons of surgical authorities teaching that "in

The bedstead itself is provided with all the necessary appliances and conveniences for reducing and curing fractures of those bones in the human anatomy which require extension in order to keep the fractured parts in apposition while union is taking place.

In the engraving, *A* represents the bed bottom, which the inventor makes solid, as a board bottom is best adapted to the various devices which are to be attached to it. The bed frame or bottom is supported on legs which are arranged so as to be removed if desirable. The removable head board is secured to one end of the bed by screws and is supported by side brackets. In order to provide for the evolutions of the patient, a hole is made through the bed bottom at the proper place and a corresponding hole through the mattress and sheet, as shown in the sectional cut. The hole is lined with metal, and the lining projects upward above the level of the bed bottom, so as to form an upward projecting flange which entirely surrounds the hole. The hole in the mattress is also lined with sheet metal, and this lining projects downward on the under side of the mattress, so as to pass inside of the lining of the hole in the bed bottom, thus forming a perfectly water tight passage through the mattress and the bed bottom. The metal lining of the hole in the mattress is screwed to the top of the mattress around the edge of the hole by a

strong screw rod a horizontal bar, *k*, which can be turned after the plug is introduced so as to lock the opposite ends into the grooves in the rails, *h h*, and thus secure the plug in place. By turning the screw rod shown the plug can be properly regulated in case any depression occurs from the weight of the patient's body.

To the foot of the bed is secured by means of screws two parallel boxes, *L L*, so that their rear ends will project beyond the foot of the bed. Each of these boxes has a sliding top, *m*, and a roller, *n*, is placed across the rear end of each, its journals bearing in the opposite sides of the box. A strap, *o*, has one end secured to the rear end of each sliding cover and passes over the roller, while a tin bucket, *P*, is attached to a spring balance on the opposite or hanging end of the strap. Upon each sliding top, *m*, are placed two studs, *r r*, one directly in advance of the other. For convenience a roller is placed on each stud, the roller of the front stud, *r*, being smaller than the one in the rear stud, *r*, for the purpose hereinafter explained.

When the patient is placed upon the bed the first thing to do is to place him or her in the proper position, and by extending the well limb, determine accurately the amount of extension to be applied to the fractured one. This is necessary, as hereafter explained, otherwise the fractured limb is liable to

ing block, *X*, by links, *Y*, so that by moving the block, *X*, back or forth along the bar, the fingers, *W*, will be moved toward or from each other along the arms of the bar, *S*; a sliding finger, *Z*, is also placed upon the bar, *S*, at the head of the bed. When the patient is placed in the bed, the finger, *Z*, is moved against the top of his head, and secured in place by a set screw. The transverse sliding bar, *V*, is then moved opposite his shoulders, and his body adjusted until the fingers, *W*, press equally upon both shoulders. The same operation is repeated with the hips, thus bringing the body of the patient in a perfectly straight line.

At the foot of the bed, bars, *b b*, are arranged to slide horizontally in a socket formed between two of the boxes, *L L*, one upon each side of the bar, *T*. To the outer end of these sliding bars is secured, by a bolt, an upright bar, *d*, the upper end of which is curved over toward the middle of the bed, so as to provide a fender, which will prevent the weight of the bed clothes from falling upon the feet of the patient. Near the lower end of this bar is a horizontal arm, *1*, which projects toward the middle of the bed, and upon the extremity of this arm is formed a heel pad, *2*, as shown. A sliding arm, *3*, is arranged to move up and down along the bar, *d*, between the arm, *1*, and the upper curved

(Continued on Page 233.)

CORRESPONDENCE.

Botanical Excursions.

[By J. G. LEMMON.]

No. 1.—Pyramid Lake and Humboldt Desert. (Concluded.)

Gathering a variety of strange plants amidst the sage brush and scoria of Pyramid lake valley, we prepared for the further journey in search of exceeding horrors by stopping at the house of Dr. Wood, the only white inhabitant of the north shore, to re-organize, obtain supplies of food, and get directions and instructions where to find and how to prepare for

Humboldt Desert.

Northeastward of Pyramid lake, separated only by a low ridge, and stretching away to the Humboldt mountains, is a great desolate plain, in the burning center of which is seen the work of evaporation so offensively illustrated in Pyramid valley carried to completion. The result is, a white, level, hard, deeply cracked bed of residual matter, extending 40 miles in a nearly circular shape. This is the sink of the Humboldt. The waters of this largest of the great basin rivers—increased ten-fold in winter—overcome the less evaporation of that season and flood the whole desert, moistening the conglomerate elements of the bed, to reek with pungent, stifling gases the long summer after. No animate objects are seen in all its bordering plain for hundreds of miles, and few are found save only myriads of large black mosquitos that rise out of the low bushes, and without a note of warning attack the intruder as if they expected but one meal in all their lives. This desert—a type of the beds of the evaporated lakes of the great basin—cannot be appreciated by merely gliding along its borders in the rail cars of the C. P., stopping only at the oases. One must be obliged to stagger blindly through the glare day after day, and camp upon its steaming floor at night.

We took our fill of Humboldt desert in two days and one night. That night was spent out on the rank smelling floor to rid ourselves of the mosquitos. Seven million four thousand and ninety-eight (as Mark Twain would say), followed us out, and not until after a battle of two hours with bushes did we trim off their bills, so as to be allowed to rest—but for a season only. The poor ponies, tethered to bushes on the shore, suffered such pain from the poison, evinced by constant neighing and rearing, then rolling in the alkali, that in mercy we led them out, tied them to our wagon wheels, and fought 9,473,608 solid feet of mosquitos, until becoming exhausted, we crowded into the wagon, dropped the curtains, crept under five pairs of blankets, with our boots on and a hake kettle over our heads.

The only way we could botanize the plain next day was for me to arm one band with a bush, and continually whip my face, with the other hand grasp blindly for flowers, while Prof. Case stood over me with a wisp of bushes in each hand, with which he lashed alternately my shoulders and his own. We thus secured a number of rare prizes, among them a fifth new *Astragalus*, which properly bears the name of *Astragalus Casei*,—Gray.

The White Monuments.

Through the glare and exhalations we gazed with shaded eyes out over the shimmering floor as over a sheet of iron raised to white heat. We knew that the old emigrant route crossed this terrible desert near, and from an eminence we could detect far in the distance and stretching across the waste that broad belt of whited skeletons that commemorate the toil, exposure and death of so many animals and men in the early pioneer days. Let the California poet describe the appalling spectacle. I cannot.

Who journeys o'er the desert now
Where ebbs engulfed the Humboldt river,
Arrested in its sudden flow
Yet pouring in that sink forever,

Who journeys o'er that desert now
Shall see strange sights and ghastly,
For he shall trace afar, slow,
Across this waste extended vasty,

A zone of bones that bleaching lie
Where fell the wearied host o'er-driven,
And upward cast its dying eye
As if in dumb appeal to heaven.

For lengthening miles on miles they lie—
These sad memorials, grim and hoary,
And every whitening heap we spy
Doth tell some way-worn pilgrim's story.

Hard by each skeleton there stand
The wheels that drew, or warped, or shrunken,
And in the drifted, yielding sand
The yoke or rusted chain lies sunken.

Nor marvel we if yonder peers,
From out some scooped-out grave and shallow,
A human head, which fleshless leers
With look that doth the place unallow.

Each annual pilgrimage hath strewn
These monuments, unnamed, undated,
Till now, were bones but piled on bones
And thousand wrecks but congregated,

A pyramid would rise as vast
As one of those old tombs, Egyptian,
To tell of toil more great—long past,
And death—without their dim inscription!

Return to Pyramid Lake.

Returning by the same route to Pyramid lake which looked quite beautiful now after

the desert, Prof. Case amused himself with shooting pelicans from the rocks along the beach, while I drove along the dreary road, unenlivened now by the novelty of its floor, once seen. By practice my vision at a certain range has grown so keen that four rods off I can detect plants two inches high and distinguish their characters, but I see nothing else. A hare or sage hen I seldom note, much less a gopher or owl. Perhaps this is why I have not seen a grizzly bear in all my travels. Case declares, however, that it is because of my inveterate whistling or singing, enough, he says, to frighten a grizzly a half mile away.

On this monotonous home trip along the shore of Pyramid lake for 30 miles, I only found one plant not seen before, but that proved to be a very interesting new species of Dr. Gray's new genus, *Glossopetalon Nevadaense*. It is a spinescent shrub of bright green hue and growing in one ravine only near the water's edge.

The Boat Ride, and What Came of it.

Going into camp, as we thought, near the south end of the lake, one day at an early hour, seeing a skiff moored in a lagoon and being out of provisions the Professor proposed that we improvise a sail for the skiff and go over to the reservation—seemingly only a few miles—for supplies. I readily consented and picketing the ponies with long ropes on a patch of salt grass with the lagoon accessible, I assisted in handling equipments for a day's botanizing and hunting into the skiff, upon which Case had rigged a sail made of a blanket spread by a long stick lashed with haling rope to an oar for a mast. Another stick distending the lower corners of the square sail the Professor held in his hands, while with the other oar I guided the craft. Gayly we sped over the dark waves, driven by a fine breeze nearly astern, past Pelican rock, (pshaw, what a smell!) past promontory and cove, islet and sand bar, the wind freshening at sundown to a stiff breeze, driving our little skiff before the white capped waves, faster and faster. Our black ponies and white covered wagon disappear, but the supposed patch of willows seems not a rod nearer. Passing at length a gorge in the mountain rim a gust of wind issuing from it steered our skiff around and drove us towards the roaring sea. A second gust wrenched the sail from Case's grasp and almost capsize the skiff. Screaming with delight he recovered the sail, while with difficulty I brought the boat to the wind. I began to express fear of danger, which Case scouted as groundless, and on again we flew before the gale. Time after time the boat was nearly capsized and the sail yard got away from Case. Thoroughly alarmed I appealed to him to lower the sail. "I have weathered worse squalls than this," he replied cheerily, but his voice was nearly lost in the roar of the sea, its face now too furiously swept for waves, appearing a level sheet of foam. "Case!" I cried at last, "I would as leave go down here as anywhere, and with you as anyone, but think of the trouble it would give to learn our fate. Think of the Odd Fellows. Think of our mothers!" He obeyed instantly. Wrenching out the mast he threw the sail overboard, and not a moment too soon. A squall laid our skiff on her side and drove the foam sheer across her length, but strangely enough we shipped but little water and our craft instantly righted. "You're right, Lemmon," said the sailor with emotion, as he joined his strength with mine, now at the oars to keep the skiff afloat, and head her shoreward. Only by the exercise of our utmost strength could we hold our position in the wind's eye. Squall after squall struck our little skiff and tossed it like a cockle shell to leeward. A half hour passed. Not a rod gained. We studied precision of stroke, pressed our oars deep into the brine and pulled for dear life. An hour. The shore but a few rods off at the first, seemed a few feet nearer! "Take courage," cried Case, "we are gaining." Two hours of the most desperate rowing ever I saw, and the gallant Case, jumping into the breakers, seized the skiff and drew it to land!

Rest followed; rest the most refreshing and fullest enjoyed as we lay for five minutes outstretched upon the sand. Then came resuscitation and the taking of observations for whereabouts and condition. O, so thirsty, so hungry, so tired! Saved helply from a watery grave, but on a bleak shore, our wagon and the lagoon of drinkable water an unknown distance away, darkness closing down and the watch showing 8.30 by the titill match. We resolved that we must pack ourselves with our things and find the wagon where was water, three little mourning doves the Professor had lagged during the day and a roll of blankets. Dividing our things into two parcels we found that in our thoughtlessness, nearly all our wagon load had been put into that skiff. An enumeration of the heavy articles, guns, equipments, game bags, flower presses, etc., would require a long paragraph. Staggering through the yielding sand, tangled often to falling by the low bushes, we toiled onward. Every few rods we were obliged to halt and take a rest. Night deepened to intense darkness ere the glad but husky voice of Case far in the advance announced the white wagon in sight. O, what sweet water! Never was tastier meat than that raw morning dove! never softer feathers than that wagon box!

Well, I have done some terrible marbling in my day, have been driven by overpowering columns to wade to my knees night after night through the red clay mud of Georgia, and I have suffered for six months the starvation fare of Andersonville. But I was young then. It seems to me now that the row for life on Pyra-

mid lake and the search for water and food that night was the very climax of toil and pain!

But you, dear reader, end we, have had enough of Pyramid lake and Humboldt desert. Brighter voices of a kinder clime invite description, and time is short. Hastening the next day over the worst of roads, so rough that I had to hold the wagon upright with a long guy rope, upon which I pulled with all my strength as I walked along the bluff above, to the agency 28 miles, where we obtained a square meal, rested a half day, learned much concerning the Piutes—especially their superstitions and names of desert plants—visited the curious volcanic, toad-stool-like columns in the vicinity, then hastened homeward via Wadsworth, Reno and Crystal peak to Sierra Valley, a round trip of 420 miles in 15 days, our wagon piled to the peak with bales of flowers, our faces brown as Indians, our eyes blood shot, but our minds indelibly impressed with very many exceedingly pleasant memories and one dark, startling, horrible night-mare—the boat ride on Pyramid lake!

Placer County Mines.

EDITORS PRESS:—Mining matters are very quiet here just now, several of the larger mines not being worked, and only one small four-stamp mill running on custom work. The Crater mine, belonging to the St. Patrick company, continues to show rock fully equal to its average, taken at present from the 312-foot level in shaft No. 1. This shaft has a depth now of over 500 feet on the incline. A 12-horse power engine raises easily all the rock the mill can crush, and could supply three times the number of stamps. Another engine of 20-horse power operates a five inch and a six inch pump. The pumps have five feet lift and a very low rate of speed keeps out all the water. Shafts Nos. 2 and 3 are not worked at present. A 15-stamp mill, operated by a 40-horse power engine, has been kept going all the winter, notwithstanding the difficulty of getting wood hauled, until March 1st, when the roads becoming utterly impassable for the wood wagons, operations ceased. Without more storms the mill will soon again be at work.

Bellevue and Green mines are not working, but the former is about to start under very favorable auspices.

The Kirkland company are working one mine light handed, and have recently bonded the Good Friday, which is now being prepared for active operations by straightening the shaft and retrimming some unsafe places. Some specimen rock from this mine exhibits a richness almost beyond belief.

A number of small claims are being worked with average success.

Near Newcastle, one mine, that of A. H. Sohnael, is actively worked. He is sole owner of this mine, and has been operating with more or less success for 12 years; but having started without capital aid development and improvements have been on the actual product of the rock. In reaching the present depth of 230 feet, six drifts have been made, but the rock is now being taken from the lowest level. At the 150-foot level the vein was 18 inches, and the present depth is four feet. The hoisting is done with a 25-horse power engine, which also raises in buckets all the water. There being nothing but surface water, no pumps are needed. Twelve teams are employed in the mine, and a Coe steam drill is now being put in. In the mill, 20 stamps are at work now, and 10 more are about to be added, worked by a 50 horse power engine. Everything here is solidly built upon heavy rock foundations, permitting no jar or vibration. There is a very marked equality in the yield of this mine, having preserved its average of about \$8 for years past.

Near Colfax the Rising Sun continues its steady work. Their ledge is almost perpendicular, and the shaft is now down 600 feet and ore being taken from this level. At the same time they are sinking for a 700-foot level. The 200-foot level has been worked 800 feet, and the east drift shows no signs of giving out. The shaft is partitioned, and two tubs used in hoisting, which is done with a 20-horse power engine. Another engine of same power works the two eight inch pumps, which readily keep out the water. Their works are arranged very conveniently, the mill being alongside of and under the same roof with the hoisting works, allowing one engine man to attend to the three engines. The rock is represented to average \$28, and since 1867 the mine has yielded \$350,000. The prospects now are improving, being decidedly better than two years ago.

Opbir, Plerce Co., March 30th.

SALES OF MINING PROPERTY.—We learned yesterday that one of the mines of Pennsylvania district, owned by Messrs. Sultan, Carlow and McDougall, had been sold to Mr. Higbee, of Oakland, California, for the sum of \$14,000. The money is payable on the 10th of April. Mr. Higbee, has also purchased the Green Monster, another mine in Long valley, both mines comprising 2,200 feet, for which he agreed to pay the sum of \$4 per foot. The contract of sale also provides for a mill, to be erected by the first day of October, 1876. The districts surrounding Pioche are looming up, and, as they can get supplies no nearer than Pioche, of course they will aid it.—*Pioche Record*.

Liability of Stockholders.

The following bill, having been passed by the Legislature and signed by the Governor, is now a law, and every one interested in incorporated companies should read it carefully:

An act to amend section 322 of the Political Code. Each stockholder of a corporation is individually and personally liable for such proportion of its debts and liabilities as the amount of stock or shares owned by him bears to the whole of the subscribed capital stock or shares of the corporation, and for a like proportion only of each debt or claim against the corporation. Any creditor of the corporation may institute joint or several actions against any of its stockholders for the proportion of his claim, payable by each, and in such action the court must ascertain the proportion of the claim or debt for which each defendant is liable, and a several judgment must be rendered against each, in conformity therewith. If any stockholder pays his proportion of any debt due from the corporation, incurred while he was such stockholder, he is relieved from any further personal liability for such debt; and if an action has been brought against him, upon such debt, it shall be dismissed, as to him, upon his paying the costs, or such proportion thereof as may be properly chargeable against him. The liability of each stockholder is determined by the amount of stock or shares owned by him at the time the debt or liability was incurred; and such liability is not released by any subsequent transfer of stock. The term "stockholder," as used in this section, shall apply not only to such persons as appear by the books of the corporation to be such, but, also, to every equitable owner of stock, although the same appear on the books in the name of another, and also to every person who has advanced the installments or purchase money of stock in the name of a minor, so long as the latter remains a minor; and also, to every guardian or other trustee who voluntarily invests any trust funds in the stock. Trust funds in the hands of a guardian or trustee shall not be liable under the provisions of this section by reason of any such investment, nor shall the person for whose benefit the investment is made be responsible in respect to the stock, until he becomes competent and able to control the same; but the responsibility of the guardian or trustee making the investment shall continue until that period. Stock held as collateral security, or by a trustee or in any other representative capacity, does not make the holder thereof a stockholder, within the meaning of this section, except in the cases above mentioned, so as to charge him with any proportion of the debts or liabilities of the corporation; but the pledgor, or person, or estate represented, is to be deemed the stockholder as respects such liability. In corporations having no capital stock, each member is individually and personally liable for his proportion of its debts and liabilities, and similar actions may be brought against him, either alone or jointly with other members, to enforce such liability as by this action may be brought against one or more stockholders, and similar judgments may be rendered. The liability of each stockholder of a corporation formed under the laws of any other State or Territory of the United States, or of any foreign country, and doing business within this State, shall be the same as the liability of a stockholder of a corporation created under the constitution and laws of this State.

Address by the Centennial Committee.

To the People of San Francisco:—Your Centennial Committee hereby calls your attention to the fact that the Legislature has declined to make any appropriation in the premises. This refusal, humiliating as it is to our State pride, compels us to action, as individuals. The world-wide reputation of Californians as a rich and liberal people, has certified in advance that the Pacific coast shall be properly represented at our 100th anniversary. We should feel, and all men would say that we had certainly fallen from our high estate, and were untrue to ourselves, if, in that hour of our national pride, we have done no part in the work—have no representation of our fabled wealth and productions—and copy not a conspicuous part in the grand display.

Nature has been bountiful to us of her treasures, and it is peculiarly fitting that the Golden State should be creditably represented at this national festival of our country's arts and products. Indeed, a neglect to so appear would be inexcusable, and a reproach to the people.

Our sister States, with much less of prosperity than has blessed us, and with no greater cause for exultation, have secured proper representation and ornamental buildings at the exposition, and expect to meet us there.

It cannot be that our National or State pride is less than theirs. To take our proper place at the Centennial exposition, it is necessary for our citizens to act liberally and with promptness.

We, therefore, urgently request that when our sub-committees, duly authorized, shall call upon you for that purpose, you will subscribe in such manner as to secure for yourselves and our State a respectable showing before the world, and which will maintain our historic fame for abundance, large-heartedness, public spirit and pride of country.

WM. S. O'BRIEN, President.

Committee: Geo. S. Dodge, J. B. Frisbie, J. P. Jackson, A. C. Bradford, F. MacCrellish, W. C. Burnett, Wm. H. Martin, Josiah Belden.

MECHANICAL PROGRESS

The Use of Steel in Boilers and in Locomotive Fire Boxes.

According to London *Engineering*, steel is coming into very general use in England for stationary boilers and locomotive fire boxes. That authority states that thousands of tons of steel boiler plates are now being turned out in Bolton, Barrow, Sheffield and elsewhere in England. Messrs. Hicks, Hargreaves & Co., of Bolton, alone have turned out considerably over 3,000 tons of steel boilers for stationary purposes, and they now never make iron boilers unless specially ordered to do so. Messrs. Platt Bros. have for a long time used nothing but steel for the boilers at their enormous establishments, and some of these steel boilers have been over a dozen years' service. Messrs. D. Adamson & Co., and other well-known makers too, have turned out scores of steel boilers for use at mills, etc., and Mr. Adamson has for a long time made it a practice to construct the furnace ends of the flues of Lancashire boilers of steel, even when the rest of the boiler is of iron. Steel boilers are also in use at sea, but as yet this material has not been so extensively employed for marine as for stationary purposes.

Mr. Webb is also introducing steel boilers on the London and Northwestern railway. This application of the steel boiler has been approached very cautiously and carefully, tests have been adopted to secure uniformity in the quality of the plates used, and it is certain that by maintaining this system of testing and by the proper treatment of the plates during their manufacture into boilers, Mr. Webb has been able to secure most highly satisfactory results. Before the nature of the material was properly understood, Mr. Webb, and Mr. Ramsbottom before him, met with failures, but these failures were regarded not as reasons for giving up a valuable material, but as lessons teaching how it should be used, and hence the present success.

Steel Fire Boxes.

On the London and Northwestern the experience as regards steel fire boxes has not as yet been anything like as extensive as that of steel boiler shells, nor has it on the whole been so satisfactory; but the knowledge gained has not been thrown away, and according to *Engineering*, Mr. Webb may now be fairly credited with having made a success of steel fire boxes as well as steel boilers.

The fire box plates used at Crewe are, after being rolled, dipped while hot into cold water, and are then re-heated and again dipped, this treatment being repeated four times. This mode of treating fire box plates—a mode which has also been resorted to in the United States—has remarkable effect in toughening the plate, while it also weeds out any which are unsuitable. Among the things taught by experience, both in Europe and in America, is the fact that it is desirable to protect the riveted joints of steel fire boxes as much as possible from the action of the fire, and it was this belief which led Mr. Webb to design the system of fire box construction which he now uses, a system by which the corner joints are avoided, while the tube plate is flanged outwards towards the barrel.

Reverberatory Furnace and Cupola Iron.

Iron melted in a reverberatory furnace is stronger than when the melting has taken place in a cupola. The reverberatory iron has a strength of 5,000 pounds to the square inch greater than when melted in a cupola. The minimum of all good foundry iron should show a strength of 25,000 pounds to the square inch. —*Mines, Metals and Arts*.

The maximum should show a strength of over 32,000—approaching 33,000 pounds to the square inch. Between castings made from a reverberatory furnace (air furnace) and from a cupola. The above is about the mean of the relative strength of the two. In cast iron, as in most other materials, strength and hardness are to some extent opposite. When your castings are hard they lack strength, and when strong they lack in hardness. To combine the two, a coal blast charcoal iron cast from a reverberatory furnace presents in the fracture or finished face of the casting a mottled appearance, and this, to the educated eye, shows its character. —*Am. Manufacturer*.

BOILER TUBE STOPPER.—To insure speedy repair in case of collapsed boiler tubes, a new stopper, or self-acting plug, has been introduced and tried with success. It consists of two iron pistons, slightly less in diameter than the diameter of the tube to be closed, and joined together by a wrought iron rod 46 centimeters (about 18 inches) long. On the face of each piston is cut a square ring or groove 13 millimeters (about half an inch) wide. A rubber ring is fitted in each groove, thus making a loose packing for the piston. Small holes are also bored through the inner face of each piston, and just under the rubber rings. In use, the stopper is pushed into the tube till one piston passes the fractured place. On raising the steam, the water enters behind each piston through the break, and pressing on the inner side of the rubber rings, through the holes beneath them, expands them till they plug the tube in both directions. —*Scribner*.

Small Steam Engines.

The idea of making small steam engines in iron frames, so that they may be screwed to an upright wall, like a picture or clock, is being carried out. By this device they are placed in a secure and convenient position, are easy of access, and economical of floor space.

A correspondent of the *Scientific American* speaks as follows of what a small steam engine with a "home made" boiler may do for a farmer's purposes:

As many of your readers are interested in the performance of small engines, I will tell you what we have accomplished with one, diameter of cylinder of which is three inches, and length of stroke five and one-fourth inches. I can only give you the amount of work done, for we have neither steam gauge nor water glass. On February 2d we threshed 239 bushels of oats inside of five and one-quarter hours. The threshing was 120 feet from the engine, and was driven by a one-half inch seagrass rope from engine to idler, thence by three inch belt to threshing. The snow drifted on the engine so that it was nearly covered; the parts that were hot, however, kept the snow thawed.

The boiler is of our own design, built entirely of one inch gas pipe, and has about 50 feet of heating surface. I have taken your paper for years, but I have never seen any design at all like this one. It works to a charm, does not leak a drop, and will stand immense pressure. It holds out three pails of water, and is as easily managed as any 36 or 40 horse shell boiler; and I have had some experience with such sizes. We have designed a pump expressly for this boiler, and I will venture to say it cannot be beaten for one holding so small a quantity of water. The amount of fuel used in threshing the grain above mentioned was four and one-half cords of old rails, cut to two feet lengths. The engine made about 300 revolutions per minute, working steam at full stroke. I can give you no better data, but I think the results are hard to beat. We are farmers and not machinists, but we have constructed the entire engine and boiler.

The above communication is from Mr. L. Cooper, of Cortlandville, N. Y. The very general call given by the newspaper press, about a year and a half or two years since, seems to have produced a large crop of small engines for various purposes, which will ere long be so far perfected as to prove a great advantage in almost every department of small industry.

The New Grinding Process.

The new process for grinding grain, recently introduced in New York, whereby the grain is beaten into flour instead of being reduced by a grinding process, is attracting considerable attention. The process is similar to that exhibited in this State, a few years since, for grinding quartz. The machine used has an external appearance like a fan blower. Inside iron disks or fans revolve with great speed—from 1,700 to 2,000 revolutions per minute. The wheat is, according to the *N. Y. Bulletin*, fed to these receptacles the same as in an ordinary mill, and goes through a similar holting and purifying process, and the flour comes out in a perfectly cool condition. At an exhibition given not long ago, 100 barrels of flour were produced from 450 bushels of wheat, a great saving of wheat as compared with the old system. It is claimed that one machine will do the work of 18 runs of stones, and with 25 per cent. less power, the capacity being estimated at 800 barrels of flour per day. It is said that millers who have witnessed the operation seem generally willing to admit that it would accomplish all claimed for it.

The paper from which we quote remarks that the machine may also be applied to the reduction of hard rock, quartz, etc. The experiments in that direction made in this State do not warrant the latter statement, as we believe they were not such as to warrant its practical application at any quartz mill on the Pacific coast. The beaters and walls of the machine could not stand the great friction attendant upon the reduction of rock. There is, of course, much less friction in reducing wheat to flour by this process, and the heating of the flour, so difficult to be avoided in the use of stones, will never trouble the miller who uses these heating machines.

A New System of Railway Signaling.

The Paris correspondent of the London *Times* says: The French Minister of Public Works has just addressed a circular to the railway companies, calling their attention to an apparatus designed to prevent the terrible accidents resulting from the inefficiency of danger signals. The results communicated to the companies, by the circular may be considered conclusive, and seem destined to make up for the inadequacy of optical signals, which are naturally thwarted by fog or by a sharp curve, an inconvenience which it has been attempted to remedy by fog signals.

In England a mechanical contrivance has been devised, putting in motion a rod which, being struck by the engine, produces a whistle; but experience has proved that this device is not infallible. The system indorsed by the Minister of Public Works seems, on the other hand, to meet every objection. It can be placed at any distance, as it acts simply by flying down a wire. The board which indicates danger in moving excites an electric current which leads to an apparatus placed in contact with the locomotive, and which produces a

loud whistle. As soon as the indicator no longer represents danger the current is interrupted, and the locomotive may come in contact with the apparatus without causing a whistle. These experiments have been made during snow, and have invariably succeeded, the warning being given at a sufficient distance to allow of a train at full speed being pulled up in time.

SCIENTIFIC PROGRESS.

Scientific Weather Predictions.

The telegraph of Wednesday last (March 29th) states that it was predicted a day or two previously that a very severe rain storm was approaching New York city, and that it reached the city as predicted, and at the date of the telegram "was raging violently." The wind was blowing a gale and the rain falling heavily. The indications were that the storm would continue through the night. The Signal Office reported that the storm had reached Indianapolis that day from the West, and was also raging at Pittsburgh, Nashville, Louisville and Cincinnati. It was first noticed on the 26th inst. (three days before) at Fort Gibson, Indian Territory, and had traveled east. There had been a great deal of snow all along the northern edge of its track, and on the southern edge a bitter cold snap was following in the wake of the storm.

The fact that storms may thus be predicted with a great degree of accuracy is now pretty generally conceded, and the utility of the Signal Service is beyond question. The chief officer of the Signal Service reports that 87 per cent. of the predictions made during the past year were verified by the results. The Bureau has arranged the weather programmes for the country for the past five years, and the chief officer feels bold to assume that its reputation as a useful institution is established.

SEEDS GERMINATING IN ICE.—INTERESTING SCIENTIFIC EXPERIMENT.—Having observed that seeds of *Acer platanoides* and *Triticum*, which happened to have come into an ice cellar with some blocks of ice, had germinated between these, M. Ulth was led to experiment on this subject. He placed seeds of various species in grooves made in ice blocks (inclosed in cases), over which he laid plates of ice, and kept the whole in an ice cellar. Other similar seeds were sown in earth surrounded by ice. The cases were placed in January, and observed in March and May. A number of seeds germinated, and those of *Cruciferae* and *Gramineae* seemed to do so with special facility. Those in ice and those in earth seemed to germinate pretty equally. The roots penetrated into the ice (in the former case), and an interesting question arose as to how this occurred. M. Ulth considers that the process was facilitated by the heat liberated in growth of the root, melting the ice. M. Sachs thinks that the ice (in the original case, which suggests these experiments) being surrounded by warmer bodies, these may have heated the roots by radiation; but M. Ulth points out that in his experiments the ice was too thick for this, and if such a cause had operated, other bodies frozen in the ice, such as straw and wood chips, would have got heated and sunk in the ice, which was not the case. —*Boston Journal of Chemistry*.

ANIMALS CAN ABSORB ATMOSPHERIC NITROGEN. The nitrogen of the atmosphere has generally, heretofore, been thought to have no other useful purpose in the economy of nature than to act as a mere diluent of oxygen and carbonic acid. Recently, however, Prof. Ville has doubted this assumption, and proved, by direct experiments, that the leguminous plants can absorb nitrogen directly from the atmosphere, while only the graminifolious plants need nitrogen in the soil, in the form of nitrate or ammonia. And now M. Charbonnier, a Berlin scientist, comes forward with a treatise in which he assumes to prove that animals may also derive nourishment direct from the air. He shows that emaciated human beings can live for long periods without food, maintaining that the nitrogen from the air which finds its way into the circulation through the process of breathing is alone sufficient to sustain life. The Belgian society of medicine regards this theory of importance enough to direct the publication of the memoir in its printed transactions.

A WORTHY SON OF A SCIENTIST.—Mr. Alexander Agassiz has recently been elected to his father's place in the three principal zoological and natural history societies of Europe, in each of which the number of foreign honorary members is limited. He has been also the first to receive the grand honorary Walker prize of the Boston Society of Natural History, which is given only once in five years for the most important publication on natural history of the United States during the previous period of five years.

NEW PROPERTY OF GLYCERINE.—R. Godeffroy, on examining a chemically pure glycerine from the Apollo Japan works, in Vienna, found that when heated to 150 deg. it took fire, and burned with a steady, blue, non-luminous flame, without diffusing any odor or leaving a residue. The glycerine had the specific gravity of 1.2609. This property enables glycerine of lower specific gravity to be burned by means of a lamp wick.

A New Fossil Reptile.

At a late meeting of the London geological society, Prof. Owen read a very interesting and important paper on the "Evidence of a Carnivorous Reptile About the Size of a Lion." A small portion only of the reptile had been found—merely a portion of the jaws and the left humerus. The upper jaws displayed a pair of carnivorous canine teeth. The fossil was from a supposed triassic formation in South Africa, a locality which has already given to science a large number of most remarkable and characteristic specimens of the reptilian type.

The Professor discussed at some length the remarkable resemblances presented by these early reptiles, in some parts of their organization, to mammals, and referred to the broad question opened out by their consideration. He inquired whether the transference of structures from the reptile to the mammalian type has been a seeming one, due to accidental coincidence in species independently created, or whether it was real, consequent on the inheritance of species by secondary law. The lost reptilian structures dealt with in the paper are now manifested by quadrupeds with a higher condition of cerebral, oculatory, respiratory and tegmentary systems, the acquisition of which, the author thought, is not intelligible on either the Lamarckian or Darwinian hypothesis.

He discussed, somewhat in detail, the character of this new fossil, and intimated the probability that there exists a whole group of reptile genera in the lacustrine deposits of South Africa, all caravivorous, presenting more or less mammalian analogies, and for which he proposes to form a distinct order, under the name of *Theriodontia*.

The President remarked that Prof. Owen's paper was a most important and suggestive one, especially as regarded the views advanced respecting the connection between these old carnivorous reptiles and the mammalian carnivores.

Prof. Saley alluded to the extraordinary characteristics presented by the creature described by Prof. Owen; remarked that the present representatives of the *reptilia* are the chelonians, crocodiles, lacertilians and ophidians. He considered that there could be no doubt as to the connection between reptiles and mammals, and that Prof. Huxley was wrong in his views as to the relationship between birds and reptiles. Every mammalian type has a reptilian brain in its earliest stages. The suggestion of the formation of a new order seemed to him to be founded upon certain points which could not be regarded as absolutely proved.

THE ENGLISH SUB-WAELDEN EXPLORATION.—Some five years ago a number of scientific gentlemen in England undertook a scientific boring enterprise a short distance to the south of London, with the view of ascertaining the true character of the strata underlying that portion of the island of Great Britain, and as we understand it, on the part of some, with the expectation of developing sub-waelden coal measures, somewhere within 1,500 feet below the surface. This we believe is the first boring for purely scientific purposes ever undertaken in England, and the first extensive operation of the kind ever undertaken anywhere. The anger recently reached a depth of 1,850 feet; a careful and scientific record being kept of every foot of earth which it passed through. The object of the commission having been accomplished, work was discontinued a few months since. The anger employed was the circular diamond drill, by which the workmen were enabled to bring up solid cores of the various strata, two inches in diameter, from the lowest depth reached. For all purposes of a careful scientific examination these cores were as useful as an enlarged shaft into which the explorers could descend.

THE ASTEROIDS.—The number of these small planets which have thus far been discovered, is 159. The two last, Nos. 158 and 159, discovered respectively by Herr V. Knorre on the 4th, and M. Paul Henry on the 26th of last January, have been named Koronis and Emillia. The latter was discovered so long after its opposition that it is extremely desirable to obtain more observations of it soon, for the calculation of its orbit before it passes out of view; but, the planet being very faint (below the twelfth magnitude), such observations can be made only with the aid of a very powerful telescope.

A NEW INCANDESCENT LIGHT.—Hannecker, taking advantage of the properties of incandescence, has obtained a lamp of extraordinary brilliancy by directing the flame of a spirit lamp of special construction and fed by a current of oxygen against a cylinder composed of silicate of lime, magnesia and olivine, which latter is a natural silicate of magnesia. The cylinder composed of these earths is compressed by hydraulic pressure, in a manner not very different from the method employed for forming the cylinders used in the Drummond light.

An Antwerp chemist has lately discovered that the vapor of chloroform will not only extinguish the flames of petroleum vapor very speedily, but will even destroy its explosive and combustible proportions, if mixed with it. This discovery may prove capable of practical application in the prevention of fires.

FINE GOLD will melt at 2,016 deg. Fah.; pure copper at 1,994 deg.; fine silver at 1,873 deg.; and pure spelter at 773 deg.

The Mining Share Market.

The Mining Share Market.

Our stock tables will show the fluctuations in the various stocks during the past week. A considerable decline is apparent in the market, and on Tuesday and Wednesday there was quite a bad break.

There are a number of causes to which this decline may be attributed. The first and chief is the bad news from the Imperial mine. The north drift has again struck porphyry, and the greater part of the face is in that material and barren quartz. This news would naturally have more effect upon the Alpha stock than upon the Imperial itself, as the drift is now very close to the Alpha line, and should the ore body give out at this point Alpha would get no share of it. The Savage assessment didn't help matters much, it being double what was expected, and caused a deal of growling among its holders. It would naturally be supposed that the Consolidated Virginia dividend would have strengthened that stock if not other, but quite the reverse was the case, and it declined with all the rest. There has been an impression that it would declare a three dollar dividend this month, and its failure to do so weakened the stock.

The Woodside has levied an assessment of 25 cents per share, delinquent May 4th.

Savage levies an assessment of \$2 per share, delinquent in office May 8th, and day of sale May 27th.

The Consolidated Virginia and Belcher declare dividends of \$2 and \$1 respectively.

A meeting of dissatisfied Leopard mine stockholders is called to meet on Wednesday, the 12th inst., at the Fourth district court room. Rich developments are promised.

As will be seen by our Shareholders' Directory, Crown Point has levied an assessment of \$1 per share.

Machine vs. Hand Labor.

One great advantage which American manufacturers possess over the English is the greater and more diversified use of machinery in this country. A large amount of shop work that is done by machinery here is still done by hand work in England, and our machinery is thus more than a match for the cheap hand labor of England. The London *Times* long since called the attention of English manufacturers to this fact, and warned them of the evil consequences that would follow the persistent effort of the workmen of that country to keep machinery out of the shops and mines. In speaking of the watch making industry, in particular, the journal said: "If we would hold our own in Europe we must follow the example of the Americans, who have so successfully used ma-

day the American cotton and
features are underbidding the E

manufacturers are undertaking the largest in the cities of Manchester and Sheffield. The local trade of the United States with Sheffield for the first quarter of 1873 was over two and a quarter million of dollars; for the quarter ending March 31st of the present year that business footed up only a trifle over the half of one million, and the telegraph of Tuesday last informed us of the rumor that a large Sheffield house is about to remove its works to the United States.

ENCOURAGING PROSPECT.—California never had better prospects for a prosperous season than at this moment. The winter has been long and severe, and that is what the State needed. From every agricultural section of the State come the most cheering reports, with the exception of that part which has been overflooded, which is small compared with the vast area under cultivation. The mining counties will be well supplied with water the whole season, and the yield of gold cannot help being very large. Everything points to an unusually prosperous year. Our own county never looked better. The placer mines will turn out more than their accustomed yield, and the quartz mining interest looks well, and has a very good prospect of becoming more important than ever before. The railroad will be completed in a short time, so that communication with the outside world will be easier and more expeditious than heretofore. Money is at present a scarce commodity, but that condition of affairs, it is hoped, will not last much longer. When the times here are compared with those in other States, we of California ought to be perfectly contented, and we think most people are.—*Nevada Transcript.*

THE Territorial Enterprise, in an article commiserating the people on the arrangement that has been made by the Government to obtain the product of the bonanza mines, says: "The discount suffered last month by the Consolidated Virginia company on the month's production of their mine amounted to more than \$250,000. At this rate the loss to the company for the year (considering the reduction works to be added in the early spring) will swell to the enormous sum of \$5,000,000. It needs no very elaborate reasoning to show that this should not be so. * * * And really there must be a great deal of stock jobbing behind all this panic in silver. While in the last quarter of the century \$2,000,000,000 have been added to the gold product of the world, only about \$300,000,000 have been added to the silver product; only about one dollar to every three people of the nation which uses silver as their highest circulating medium."

MINING SUMMARY.

The following is mostly condensed from journals published in the interior in proximity to the mines mentioned.

California.

PINE'S MILL—Amador Ledger, April 1: Pine's quart mill at West Point bridge, which has been idle since the commencement of winter, commenced operation again this week. Pine had a large quantity of very hard rock ready for crushing. A pile of 150 tons he estimated a will go at least \$100 to the ton.

INCREASED TO TEN STAMPS.—Mace's five-stamp mill beyond Volcano, is to be increased to 10 stamps. Workmen are now engaged in putting in the additional stamps.

THE PRESENT MINE.—The pswa that reaches us concerning this mine is of a particularly gratifying character. The lodge is said to be 40 feet wide, and the present milling facilities are not equal to the task of crushing all the rock which might, with little additional expense, be taken from this immense ore body. It is reported that during the visit of Mr. Hayward, a few weeks back, it was fully determined to put up another 40-stamp mill this coming summer. We hope the report is correct.

PLYMOUTH TREMS.—Cor. Amador *Ledger*. April 1. Mining interest, also, as far as heard of in this vicinity, is looking decidedly better; and your correspondent is looking forward to quite an excitement in quartz mining in consequence of the Phoenix developing so splendidly. My belief is that this mine as it at present stands is equal, if not superior, to any gold mine on the Pacific coast. The immense mass of good ore which this mine shows at least 300 feet of very pure and rich ore, is estimated to be ranked in the first class of paying mines, and if it continues to improve in the same ratio as it did in sinking the last hundred feet, venture to say that by the time it reaches the depth of 1,200 feet (it is now only 900 feet) it will show a body of rich ore that will astonish old Californians.

BUTTE.
DITCH BROKEN.—Butte Record, April 1: From Dr. Brotherton we learn that about 60 feet of the old Snanner mining ditch on Butte creek, was washed out by the late storm. The owners intend fluming the break, we understand.

GOLD.—On Tuesday morning we stepped into Rideout, Smith & Co.'s bank, and in the 15 minutes that we remained there, the following lots of gold were received: One lot of 100 ounces; one lot 35 ounces, and one lot of 100 ounces. Besides this, the cashier had a bag full on his desk that had come in during the day immediately preceding. At \$17 per ounce, the value of the received on Tuesday morning amounts to \$2,414. The gold came from Butte creek, Mooretown and Thompson's flat. From the mountains come the report that they will not be able to begin to work as soon as usual, but that the water will last them much later than ordinary seasons. If so, the gold business will be very profitable for the remainder of the year by nearly one-half million dollars. This is a large sum, but several new mines have been opened that are paying well, and the old ones are doing better than in previous years.

ENGINEERING PARTY.—Mr. A. L. Knowlton, county surveyor, with party, left on Thursday morning for the forks of Butte creek, to commence the location of a water ditch from that point to the Butte creek mine near Centreville.

CAVALERAS.

STRANGE'S BONANZA.—Colavoras Chronicle, April. The rich deposit of gravel discovered by Mr. J. I. Strange, in his lot in the suburbs of town, continues to yield as largely as ever. The gravel is undoubtedly a portion of the French Hill lead, that was overlooked in early days. Joh says he is "willing to forgive the buyer for overlooking it."

GWIN MINE.—The slopes of the 1100-ft level in the Gwin mine are now opened sufficiently to furnish rock for 36 stamps. The batteries are kept in continuous motion, the yield being fully equal to that of any previous year. Work has commenced in the mine. The indications are that the 1100-ft level will produce a larger amount of money than any of those above it.

UPPER COUNTRY MINING.—Bro Yelkine.—Stoping is going steadily forward in the Uxampan, and first-class ore is being extracted. The mine never looked better nor was in a more flourishing condition than at present. There has been no cessation of work in the Uxampan since the sinking of the shaft. The Uxampan Sinking has been resumed in the Mina Rica. From the Glencoe district we have the most favorable report. The "reise" in the Sau Bruno is completed and the machinery for the new hoisting works is on the ground. The entire depth of the shaft is 275 feet. It is subdivided into three levels and divided into two compartments of three feet square each. The new hoisting works are to be driven by a 20 horse power engine. The machinery on the Grasshopper is now working splendidly, and it is expected to have the mine free of water in a few days. Gass & Co. have just had some exceedingly rich ore crushed and divided into two compartments. The first yielded 760, an average of over \$50 per ton. The rock was taken from a depth of 60 feet. Plenty more of the same sort in sight. A lot of rock from the Albers mine, 32 tons, paid \$20 per ton. Good for a wide ledge and uncracked rock. Good ore is being taken from the Albers mine to the depth of about 100 feet. It is expected to be resumed on the other mines of the district in a few days.

KERN.
THE ANTIMONY MINE.—Bakersfield *Courier*, April 10.—Messrs. Temple and Bushay, of San Eudido, are putting up the machinery for working the antimony mine and expect to have all in working order next month. They are preparing for a force of 150 men. Several families have already moved into the canon. The ore will be hauled to the depot and the teams will go.

Mr. Bushay is now in charge, and has made contracts for the season. The enterprise seems destined to create a sensation in mining circles, being something entirely new to this section, and very little understood.

KENNEDY MINE.—Cor Los Angeles *Express*, April 10. Prohibit one million dollars has been spent on the mine, and it has one of the finest mills in the state. The mine during the past summer has yielded fully 10 per cent. on the investment, and it is as yet but in the initial state of its development. It is a gold mine, and

at the present depth, ore is being taken out which averages \$100 to \$160 to the ton. The new slope, upon which work is about to be commenced, will yield, Mr. Lawrence thinks, easily \$100,000 a month. The mine is of immense size, running some six or seven miles distinctly defined. Mr. Lawrence has no hesitation in saying that he thinks it is the finest gold mine ever

LAKE.
THE MINES.—*Napa Reporter*, April 1: The Wall Street mine, located six miles west of Middletown, has n

been in operation for some time, owing to the great amount of water in the mine, but work will probably be commenced again next month. W. M. Moss, superintendent of the Wall Street, The Koor & O'Leary furnace is used, and when work is being done at the mine some 25 men are employed.

THE American mine also near Middletown, employs 25 men and ships 50 flasks of quicksilver per month. A tunnel in this mine, 400 feet in length, is nearly completed.

FATAL ACCIDENT.—*Nevada Transcript*, April 1: A very singular accident occurred to Dan Murphy on Monday forenoon about 11 o'clock, which resulted in his death about 10 hours afterward. He was employed in mining at the old Sozza mine, and while engaged at work

In out of the pits, was attacked by a large crowd of men, who looked out for a piece of the hanging wall, which was about to fall. Murphy, whose land was on the end of the pick handle, leaned his body back enough to avoid the falling mass, but caught his thumb and injured it quite severely. He came out of the mine and started home, but his hand was badly lacerated. On the way he met some parties who started to tell him what had occurred to him, and how sorrowful he was. He was being killed. While talking he sat down on a large boulder by the side of the trail, which is on a steep side-hill, and while there the rock gave way. In trying to save himself he fell backwards down the hill. The rock which had been loosened followed after him, and as his head caught up against another rock the boulder passed over him, and he was killed. He was two. He was taken to the residence of Mr. Beardsley where he died at half past 10 o'clock the same evening.

MONTICRISTO QUARTZ MINE.—*Mountain Messenger* April 1: This mine, formerly known as the Johnson Ledge, has passed into the hands of capitalists, and is now known as the Monticristo. It is located about three miles from Downsville, near the Eureka trail. The present trustees are Peter Buck, Oakland; T. G. Humphreys, D. G. Humphreys, E. R. Roberts and Augustus Wilder, Stockton. We learn that this company is possessed of abundant capital, and will pursue the work of development ahead as fast as men and money can do it. We think there is no doubt but they have a very valuable property.

Closed Down.—The Eureka quartz mill, at Jamison City, closed down a few days since. They were out of wood and provisions. Quite a number of the men employed have arrived here, and more will follow in a few days.

SOUTH FORK.—Tho E. O. V., about seven miles from town, is bringing in a ditch about one and a half miles long to a bed of gravel that prospects well. They expect to be in working order in three weeks. The Par Out company, farther down the river, have three cent to the pan and extensive deposit; think it is good fe

thres or f n ncl ars per day William & Co., at Bea
verville, or Kanaka flat, while mining for a back chan
nel some time ago, struck an old tunnel not known
before and found two skeletons in hammocks, and no
doubt they had been there 23 or 24 years. The bones
were completely bare and the hammock ropes and net
ting were perfectly rotten but had fiber enough to

tain them in their places. They were, no doubt, Kanakas, who had gone into the tunnel on a warm day, the ground caved in front of the tunnel, and foul air suffocated them. Williams found good pros ected directly under where the Kanakas lay. Witzel & Co. are reported doing well in a slide further down the river. The ground looks as if it might be extensive. The Broke Down Co., (a curious name) have found a promising place, and the prospect is being rigged for work. B. Wolford & Co. have gone to the rigging and will pay from one to three ounces per day. They are opening out for vigorous work. Altogether this section looks prosperous.

RICH MINDO GROUND NEAR COTTONWOOD.—Yreka Journal, March 29: We learn that Sam Cary, of Cottonwood, is taking out exceedingly rich quartz, which pays extravagantly. It seems to be detached quartz, greatly decomposed, but it is believed that it leads to rich permanent ledge below the surface. There are also other ledges, including the Lodi, which prospectors so well come time ago in the same vicinity, and the general belief is that there are no richer ledges than these around Cottonwood, if properly opened. Cottonwood is in the line of the great gold belt, and the stream, in the country. Large nuggets have been found at various times whenever it was possible to get at water. Several years ago a large piece was taken from the old Brass Wire claim, weighing 19 pounds, mostly gold, also a piece on Dutch or Priddy quartz, weighing over 10 pounds, which was sold for \$3,000.

WASHOE DISTRICT.
IMPERIAL EMPIRE.—Gold Hill News, March 30: The greatest public interest has been centered in the developments of the north drift on the 2000-ft level for the past two weeks. The ore in this drift has, during the time, undergone several changes, from good to poor and back again to a still better prospect, keeping the public mind in a state of perfect ferment. The situation has had ought to have reached a climax by this time. The drift has been in ore for a distance of 15 feet or more, and still continues in the same. The quality of the ore is good, and the chances for the same to extend into the Alpha ground now amounts to almost a certainty.

BALTIMORE AND AMERICAN FLAT.—Sinking the main incline shaft is making excellent progress. The 1030-ft drift has partly passed through the ledge on the 1030-ft level, which, at that point, is much more concentrated and better quartz than was ever found on either of the levels above. Drifts have been started both north and south on the vein in the face of both drifts are now in the line of the level. The above developments on this level are certainly looking much more hopeful than anything that has been found in the mine since the opening of the 400-ft level.

July 1.—The shaft is now down 80 feet below the 1700-ft level. It is the intention to open another station as soon as the 1800-ft level is reached. The melior southwest drift, on the 1600-ft level has shown a very encouraging improvement in the character of the quartz and ore penetrated during the past three days.

NORTH CONSOLIDATED VIRGINIA.—The shaft has sunk 77 feet during the past month, which, considering the amount of water hoisted by the tanks and the elasticity of the shaft, is equal to, if not a little ahead of, any work of the kind yet done on the line of the Comstock. The bottom of the shaft is still in porphyry, carrying favorable streaks of quartz. The shaft is now down 790 feet.

WEBBER.—Sinking the shaft has been suspended at a depth of 155 feet, pending the putting up of new steam hoisting works and machinery recently contracted for by Superintendent Hutchinson. The foundations will be laid and the necessary hoisting works building and carpenter and blacksmith shops erected.

LEO.—The ore prospects on the level recently opened at the bottom of the winze below the tunnel level are certainly on the increase, and a considerable amount of good pay ore has already been uncovered, ready for extraction and milling.

COOK, VIRGINIA.—Daily yield, 750 tons of ore, keeping the mills running up to their full working capacity. The ore breasts are yielding the usual quota of rich ore, and show no changes whatever. The mine never looked better than at this time. There is no change in

the east drift on the 1500-ft level to connect with the C. & O. shaft, the face of which is now outside of the ore vein.

CALIFORNIA.—Sinking the O. & O. shaft is going steadily, though slowly, forward, on account of the strong flow of water at the bottom. This water is easily taken care of by the pumps, but is a great annoyance to the workmen in the shaft. Ten feet have

METALS.

[WHOLESALE.]

RECORDED - 17 28 APR 11 5 1970

WEDNESDAY M., APRIL 9, 1876		
American Pig Iron, per ton.....	33 00	@ 36 00
Scotch Pig Iron, per ton.....	35 00	@ 37 00
White Pig, per ton.....	—	@ 35 00
Pig Iron, per ton.....	—	@ 36 00
Refined Bar, bad assortment, @ lb.....	—	@ 3
Refined Bar, good assortment, @ lb.....	—	@ 4
Boiler, No. 1 to 4.....	—	@ 6½
Sheet, No. 1 to 4.....	—	@ 5¼
Sheet, No. 10 to 14.....	—	@ 5¼
Sheet, No. 16 to 20.....	5 ¾	@ —
Sheet, No. 22 to 24.....	6	@ —
Plate, No. 25 to 30.....	25	@ —
Horse Shoes, per keg.....	6 50	@ 8 00
Nail Rod.....	10	@ —
Norway Iron.....	9	@ —
Castling, Or Yellow.....	9	@ —
Other Irons for Blacksmiths, Minors, etc.....	—	@ 4½
COPPER.		
Braziers.....	35	@ —
Copper Pipe.....	—	@ 20
O'Neil's Pat.....	37½	@ 40
Sheathing, @ lb.....	24	@ 40
Sheathing, Yellow.....	—	@ 25
Sheathing, Or Yellow.....	—	@ 22½
Composition Nails.....	24	@ —
Composition Bolts.....	24	@ —
STEEL.—English Cast, @ lb.....	12	@ 25
Swedish & Woods American Cast.....	12	@ 25
Drill.....	—	@ 16½
Pist Bar.....	18	@ 22
Flow Steel.....	9	@ 10
TIN PLATE.		
No. 10x14 O. Charcoal.....	10 50	@ 11 00

[Corrected Weekly by CHARLES SUTRO & Co.]

SAN FRANCISCO, April 5, 3 P. M.
LEGAL TENDERS 10 S. F., 11 A. M., 89 to 89½.
GOLD in N. Y. 113.
GOLD BARS, 900. SILVER BARS, 12 and 16 per cent. dis-

LONDON — Consols, 93 to 93½; Bonds, 102½;
QUICKSILVER in S. F., by the dash, near D. 72½ to 75.

SEVERAL FIRST CLASS SEWING MACHINES can be had at favorable rates to the purchasers, if ordered soon, from the Grangers' Business Association, N. E. Cor. Davis and California streets. S. F.

hasn added to the depth since our last report. The winze now being sunk below cross-cut No. 6 on the 1500-ft level has reached and been connected with the north drift on the 1550-ft level, and is now being continued below the 1550-ft level, to reach a point 50 feet below, at which it is desired to connect with the Ophir works for ventilation purposes. The bottom of this winze is still in the face of a very rich character. The main north drift on the 1400-ft level is steadily advancing along the east side of the ore vein, to connect with the Ophir for ventilation purposes, the face in clay, quartz and porphyry. This drift has about 50 feet yet to run to complete the connection.

OPHIR.—Daily yield, 150 tons of ore. The ore breasts are looking well and yielding the usual good quality of ore. Three mills, the Empire State, Nevada and Wulfeid are now kept steadily crushing ore from the mine. The east shaft has been closed out and reticulated to the 1700-ft level. The ore breasts on the 1600-ft level have again been opened in good shape for the extraction of ore when it is needed. The east drift on the 1400-ft level is steadily advancing, the face in a massive favorable formation that has yet been encountered in that direction. The new building, comprising the engine house, boiler house, steam factory, and an assay office, is steadily approaching completion. This incline machinery has been tested sufficiently to prove it to work in the most perfect manner. The yield of hollon for the present month will more than pay all the expenses of the mine.

LADY BAYAN.—A sufficient quantity of ore is extracted daily to keep the company's 10-stamp mill steadily running. No regular closing up has yet been made, but the amalgam in the pump is showing well, and it will not be many days now before the shipment of hollon will be regularly commenced. The ore stones on the 1700-ft level are showing finely. The rich vein of white ore recently opened on the 1700-ft level is looking very encouraging, and there is every reason to believe that it will open into a fine body of rich paying ore when it is reached by the west cross-cut now being run on the 380-ft level.

BULLION.—Sinking the main incline below the 1400-ft level is making splendid progress. Repairing the main north drift on the 1400-ft level has been suspended for a few days to give an opportunity to cut out a station and start a winze downward from this drift, to meet and connect with the raise now being made from the 1700-ft level for air purposes. This winze was commenced day before yesterday and will be pushed to completion with all possible speed. The northeast combination drift on the 200-ft level of the Imperial is evidently approaching the main ledge.

SILVERA NEVADA.—The shaft is now down 120 feet below the 1500-ft level. On the 1250-ft level the prospecting drifts are steadily advancing, with more favorable indications of a concentration of the ledge and the development of pay ore.

MONUMENTAL.—The shaft is now down 115 feet, the bottom in hard blasting rock. Eight hour shifts are being worked, and the developments pressed ahead with all possible vigor.

GROWN POINT.—Daily yield, 300 tons of ore. The cross-cuts run on the 1600-ft level have developed large bodies of quartz and low grade ore, but nothing that will pay the cost of extraction and milling. On the 1700-ft level the main east drift has reached the east or hanging wall at a distance of 168 feet from where the ledge was first struck. The vein at that point was almost all quartz and low grade ore, but nothing has yet been found that will pay for milling.

BALCH.—Daily yield, 455 tons of ore, keeping the mills all running at full capacity. The developments for the month of March will show, if any thing, that of February, insuring the payment of the regular dividend. The mine is looking well throughout, and there is an abundance of ore in sight to keep the mills running for months to come. The ore developments below the 1500-ft level are very promising. The erection of the new pumping machinery is steadily progressing.

YELLOW JACKET.—The recent development on the 1940-ft level still continues of a very favorable character. The finding of ore in the middle cross-cut has led to the starting of another cross drift at a point half way between the middle and south cross-cuts on that level. Preparations are also being made to start a winze downward on the ore formerly developed on the 1700-ft level.

BLACKBROOK.—Sinking the main shaft is making good progress, the bottom in green stone of a close, hard character. This rock is so close that but little water can now find its way through it. The shaft has now only a few feet to sink to reach the 800-ft level.

SUCOON.—This face of the main west drift on the 600-ft level is showing a steady improvement. The north cross-cut on the same level is steadily advancing, the face in soft porphyry. There is a considerable flow of water at the bottom of the shaft.

SAVAGE.—The pump and hoisting tanks have been stopped and the water now stands at about the 1300-ft level, without either rising or lowering to any considerable extent. Taking out the old machinery to make place for the new pumping machinery is going steadily ahead.

UTAH.—The shaft is now down 150 feet below the 500-ft level. The flow of water is still great, but it is easily handled by the pumps.

SILVER CURRY.—The Ramsdell mill is now kept running to its full capacity on ore from this mine. The ore breasts and slopes are all looking and yielding splendidly, and the fine ore body being opened up some 200 feet north of the present workings, is undoubtedly a valuable additional development.

SENIATOR.—This mine is again being put in order to resume sinking the main shaft. There is now but little water in the shaft, and the company intend to crowd the shaft downward, so as to reach and develop the ore vein on the deep levels.

CHOLLAR POTOMAC.—There is no change in this mine whatever since our last weekly report. No ore is yet being hauld to the mills.

SILVER HILL.—The pumps have the water well under control, and it is considerably expected that by to-morrow the water will be sufficiently reduced to permit the men to resume work in the drifts.

KOSOVE.—Both the north and south drifts on the 500-ft level are being pushed ahead, running parallel with the ore vein, both being in a very favorable formation.

GOULD & CURRY.—The repairs to the shaft and the connecting drift with the Best and Belcher, on the 1700-ft level, is being pushed steadily forward without any new features whatever to report.

HATE & NOBORS.—No water is being hoisted from the mine, and the water in the shaft stands at the same point as heretofore reported. Preparations for the erection of the new pumping machinery is making steady progress.

MINT.—Sinking the main shaft is making the usual good headway, the bottom still in soft ledge material of a very encouraging character.

BOSTON.—This is an old and favorable location situated just east of the Best & Belcher and Gould & Curry mines. The shaft is down 55 feet, the bottom is soft ledge material, and a very favorable formation.

PAUL SHERMAN.—The erection of the necessary building and machinery, for the prosecution of the development of the lower levels, is making good progress.

AMAZON & GLASCOW.—The new machinery is running splendidly, everything working with the utmost perfection. The water has been drained from the shaft. The water is doing no material damage to the lower levels whatever.

NORTH CARSON.—The pening out and development of the various levels progresses at a lively rate, and very encouraging assays are obtained, some of them up in the thousands. A very fine looking strake of vein of ore, discovered at the surface in grading for the new hoisting machinery, is widening out and showing very well.

BALCH CONSOLIDATED.—Work is resumed on this valuable mining claim, which lies directly west and adjoining the Nevada, on American flat. The Baltic has fallen into new hands.

COSMOPOLITAN.—Work is resumed and progressing well in the drift from the winze, showing some good bunches and streaks of ore. The face of the main tunnel continues in good milling ore, and the daily yield is about 40 tons per day.

PROSPECT.—Shaft sinking at the usual good rate, and everything working well. The diamond drill has been bored to the depth of 637 feet. At the depth of 420 feet it passed into the main ore vein and is still in it, the borings giving high assays and showing that a large and rich ore vein will be opened when this shaft gets down to it.

SUTRO TUNNEL.—Face of header in very tough and hard porphyry, making the rate of advancement somewhat slower. Considerable water is coming from the face. Total length of tunnel last evening, 12,670 feet. The widening out of the main tunnel to the regulation size progresses actively.

MEXICAN.—The north drift on the 1455-ft level is steadily advancing along the east wall of the ore vein, occasionally cutting bunches of ore of a very favorable character.

LADY WASHINGTON.—Sinking the shaft is making the usual good progress, the bottom in soft ledge material. There is a considerable flow of water at the bottom.

LEVIATHAN.—Shaft 876 feet deep. It has passed through a fine strake of ore and is now in splendid milling ledge material, which indicates the near proximity to a more extensive and valuable development.

SULLIVAN.—The west drift continues in the same splendid formation heretofore encountered, and due streaks and bunches of quartz continue to be met with, which give excellent assays. Vein fissure developed 500 feet now 260 feet in width.

NEW YORK CONSOLIDATED.—The prospecting drifts on the 300-ft level are making more favorable work advances. When the enlargement of the shaft is completed, it will then be one of the best working shafts on the line of the lead.

ORIGINAL GOLD HILL.—Some bunches of high grade ore have been met with in the south ore body this week, much better than yet met with.

FLORIDA.—The placing of the new machinery is steadily and energetically going ahead. Will be ready to start into full operation in the course of a week or ten days.

OVERMAN.—The repairs to the engines have been completed, and sinking the main shaft has been resumed. The flow of water is still very great.

TROJAN.—The erection of the new hoisting works is making steady headway.

BONNYTON.—The south drift on the 550-ft level is showing some very fine milling ore. The ore vein is opening out in that portion of the mine.

GLOBE CONSOLIDATED.—The north drift on the 300-ft level is steadily advancing, the face in quartz of a very favorable description.

UNION CONSOLIDATED.—The ore prospects in the bottom of the winze on the 1300-ft level is steadily on the increase.

BEST & BELCHER.—Repairing the main drift on the 1700-ft level is going steadily forward without stoppage or hindrance.

PICTOR.—Good advancement is made with the north drift, and excellent assays obtained from the streaks of quartz passed through.

CALDONIA.—Sinking the main shaft is making steady progress. The flow of water shows no change.

DEWEY.—This mine has again started up. The water is now being drained from the bottom of the shaft preparatory to sinking.

RED AND WHITE CROSS.—More streaks of low grade ore are met with, and the indications are becoming more favorable for soon reaching the ore body.

SUPERIOR.—An ore streak or spur of the main vein has been drifted upon which assays very high.

NORTH DAYTON.—Face of north drift shows improvement giving better assays.

NEVADA.—Face of north drift in low grade ore, with increased indications of nearing the main ore chimney developed in this level above.

(Continued on Page 236)

New Incorporations.

The following companies have filed certificates of incorporation in the County Clerk's office at San Francisco:

LAFAYETTE CONS. M. Co.—March 24th. Location: Virginia district, Nev. Capital stock, \$5,000,000. Directors—Mark Sheldon, A. Walrath, W. McCully, B. Oakland and H. R. Fowler.

MANTON & CO. THEATRICAL CO.—March 24th. Object: Manufacturing machinery appertaining to the process of treating ore, invented by Chas. F. Secor. Capital stock, \$25,000. Directors—C. F. Secor, A. C. Bradford, B. F. Baker, Chas. Chandler and A. D. Squire.

SOUTHERN PACIFIC COAST R. R. Co.—March 25th. Capital stock, \$1,000,000, in 10,000 shares. Object: Construct, conduct and maintain a railroad from a point on the Bay of San Francisco to Potrero point, otherwise known as Dunbarton point, in San Mateo county, through the counties of San Francisco, San Mateo, Santa Clara and Santa Cruz, on the most practicable route, to the town of Santa Cruz, with intermediate branch lines to Saratoga and New Almaden from such points on said railroad as may be designated by the Board of Directors. The estimated length of said railroad with its intermediate branches, is about 55 miles. The term of the incorporation is fixed at 50 years. Directors are Alfred E. Davis, Edward Barron, Seth Cook, George W. Kidd, Joseph Clark and J. Barr—all of San Francisco—and Cory Feehler, of Santa Clara.

RESUMPTION M. Co.—March 25th. Location: Storey county, Nevada. Capital stock, \$5,000,000. Directors—C. Churchill, T. B. Valentine, P. H. Blake, F. M. Smith and L. Aldrich.

CONSOLIDATED IMPERIAL M. Co.—March 25th. Location: Storey county Nevada. Capital, \$0.000,000, divided into shares of \$100. Directors—A. K. P. Harmon, J. D. Fry, C. L. Miller, J. H. Dublinson, Alpheus Bull, Wm. Norris and Joseph Sharon.

ELY G. & S. M. Co.—March 25th. Location: Lincoln mining district, Nevada. Capital, \$5,000,000, in shares of \$100. Directors—J. D. Hathaway, F. W. Gistman, Charles S. Benham, A. H. Wood and L. W. Mix.

TRUCKEE M. Co.—March 28th. Location: Storey county, Nevada. Capital stock, \$100,000. Directors, C. W. Fox, O. E. DeLong, J. N. Risdon, Robt. Ash and J. W. Gashwiler.

JUNO S. M. Co.—March 29th. Location: Nevada county. Capital stock, \$3,000,000. Directors, R. P. Leach, H. H. Clement, R. L. Taylor, Mark Shepherd and C. H. Stanton.

PITTS RIVER M. Co.—March 31st. Location: Copper City district, Shasta county. Capital stock, \$100,000. Directors—F. H. Wells, W. S. Brown, O. D. Durr, Geo. A. Treadwell and H. A. Dunning.

EAST UTAH S. M. Co.—March 31st. Location: Washoe. Capital stock, \$10,000,000. Directors—G. M. Peck, B. W. Mudge, F. H. Thomas and R. G. Ives.

MONITOR CONS. M. Co.—March 31st. Location: Columbus district, Nevada. Capital stock, \$5,000,000. Directors—R. R. Craig, W. F. Russell, T. F. Hopkins, John W. Prye and Geo. A. Treadwell.

LAFAYETTE G. AND S. M. Co.—March 31st. Capital stock, \$1,000,000. Directors—G. F. McPherson, John B. Webster, Thomas S. Fowie, Benjamin S. Lathrop and D. A. Dyer.

LIME ROCK RAILROAD CO.—March 31st. Object: To run a narrow gauge railroad from Monterey bay, in Santa Cruz to a point in the Santa Cruz mountains with a branch, the whole length of the road being 10 miles. Directors—G. W. Kidd, Josiah Applegate, David McKay, John Sedgwick and S. N. Putnam. Capital stock is \$200,000, of which \$10,000 has been subscribed.

Mining Decision.

Prior Locator.—Owner of the Ore at Intersection of Two Veins.

At the last term of the district court of Bonlder county, Colorado, says the *Denver Tribune*, an ejectment suit, involving the title to some valuable mining property, came up for hearing. The owner of the American mine, at Sunshine, had applied for a patent. The owner of the Bull of the Woods, which was a cross-ledge, filed an adverse claim. On the trial, Judge Belford claimed that when two lodes crossed each other, all that the prior locator could take was the ore at the point of intersection of the two veins, and not all the vein which was found inside of the side lines of the location. The court refused to adopt this view. A short time since, Judge Belford addressed a note to the Commissioner of the General Land Office, asking for a construction of section 14 of the mining act of 1872, and receiving the following reply, which is in accordance with the construction which he asked the court to give:

DEPARTMENT OF THE INTERIOR,
General Land Office.
WASHINGTON, Feb. 25, 1876.

JAMES B. BELFORD, Esq., Central City, Colorado.—Sir: Referring to your letter of the 15th inst., I have to state that the 14th section of the mining act of May 10th, 1872, provides "that where two or more veins intersect or cross each other, priority of title shall govern, and each prior location shall be entitled to all ore or mineral contained within the space of intersection: *Provided*, however, that the subsequent location shall have the right of way through said space of intersection for the purpose of the convenient working of the said mine."

The construction which has been given to this part of the law is that a party has a right to a patent for the number of feet along his lode or vein to which he has the local title, upon full compliance with the law and instructions: provided, however, that where another lode crosses, the ore at the space of intersection of the lodes belongs to the party who owns the prior location of the two.

The law clearly refers to cross lodes, and provides that the ore at the crossing of the two lodes shall belong to the first valid location, and hence where a patent issues for a mining claim which crosses one already patented, the surface ground in conflict is excepted from the second patent, but the subsequent patentee has the right, under his patent to his lode, for the distance patented, with the proviso heretofore referred to, viz: "that the ore at the space of intersection of the cross lodes shall belong to the prior location." L. K. LIPPINCOTT, Acting Commissioner.

End of the McGarrahan Claim.

In the Washington correspondence of the *Bulletin*, appears the following: The Press telegram from San Francisco that the New Idria company have arranged for a sale of their mines to Montgomery Blair of this city for \$1,000,000, is verified upon inquiry (though the negotiations were intended to be kept secret until finally consummated), but the accompanying statement of the company's officers that this is not a compromise with McGarrahan, fails of confirmation here. On the contrary, it is learned from unquestioned authority that the purchase is agreed to as the result of offers of compromise made to McGarrahan by the company's agent six months ago. Mr. Blair represents a number of capitalists who have been enlisted through the agency of General Butler, and who propose forming a new company, in which, of course, McGarrahan will have a large interest. That the chance of ownership is more than a mere commercial transaction, is indicated by the smallness of the price obtained for the property. With the consummation of this transfer, the "McGarrahan claim" will pass out of public view for the first time in many years, during which it has acquired historic interest and notoriety in connection with every branch of the government. In some of its phases it has been successfully, and often simultaneously, before the Courts, the Executive departments and the Congress of the United States; it has variously affected the public estimate of many prominent men; decided one Senatorial contest, and (by leading to the forced retirement of Secretary Cox) made a Cabinet.

FROM WARD DISTRICT.—Very cheering reports come from this district, says the *White Pine News*. No new strikes have been made in the Paymaster mine, but the ore body continues to increase as development is made and the character of the ore to improve in richness. Forty miners are employed in the mines. It is now an established fact that the owners of this valuable property will erect reduction works early this spring, or as soon as the roads will permit hauling. We are informed that two 30-ton water jacket furnaces have been ordered in San Francisco and will be erected as speedily as possible. This company are also the owners of valuable mining properties in the adjoining district of Lake, and have ordered the necessary machinery for the erection of a 10-stamp mill. The ores of this district are of a different character from those in Ward district, being fine milling ores and of high grade. The two districts are but a short distance apart. The Martin White company have very fine prospects ahead, and the time is not distant when they will have their furnaces and mill in operation, and a new and flourishing mining camp will be the result.

Montana Mines.

A correspondent of the *Helene Independent*, writing of Butte city and its mines, says: The town, in 1877, was one of the largest and most stirring places in the county, but taking the down grade, it had in the beginning of 1875 a population of less than 100. The principal occupation of these was placer mining, and but little was done towards the development of the silver and copper lodes of the district, believed to be rich, but largely held by non-residents, who had acquired perpetual (?) title under an act of the Bannack legislature, by simply staking, recording and discovering one well rock. The act of Congress of 1872, which went into practical effect January 1st, 1875, relieved our mining interests of the incubus which for 10 years had rested upon them, preventing active development. In proof of which I have only to add that some of the richest mines in the district, now being worked, were re-located very early in the morning of 1875, and before the old year had made many miles on the way down the western slope. By this time satisfactory returns had been received from copper and silver ores shipped East for reduction, a new impetus was given to quartz mining, and now more rich ore—ore that will pay to work and ship—is being taken out of the Butte mines than in any other district in Montana.

The Centennial Mill.

Owned by John Howe, is running successfully under the management of T. H. Manning. Work has been resumed on the Ferlin mill, and W. A. Clerk, trustee, is making strong efforts to have it in running order before the end of April. Capt. Plaisted has charge of the construction of the works, and is having everything done in a substantial and workmanlike manner. The first or main building contains the drying furnaces, battery of 10 stamps, settlers, and amalgamators. The second building (both mammoth structures) contains five reverberatory furnaces, and the pulp will be removed back and forth in a car. The reducing capacity of the works will be about 10 tons per day. That of the Centennial mill is now five tons, but was built with room and power to add another battery, which addition will most likely be made at an early day.

The Mines—Copper.

W. J. Parks is taking out copper ore for shipment, from the Parrott mine, at a depth of 150 feet and ore is better and the lode larger than above. Freeman & Co. have leased the Downs mine on same lode, and they are at present engaged taking out ore for shipping. Reese Anderson is taking out good ore on the extension of Parrott. Poznansky & Bro., on the Mountain copper lode, some distance above the Parrott, have a shaft down 40 feet, a seven-foot vein with three feet of good ore, some of which is now being shipped. Several leases for two years have been taken on divisions of the same lode, from parties not prepared to work them, some three or four houses are up and work going on. The Hattie Harvey, owned by Ramsdell, Butcher & Co., is showing nearly native copper and a good body of ore.

THE STAYTON QUICKSILVER MINES.—The *Holister Enterprise* says: We made a hurried trip to Staytonville on Tuesday, but as our business was not specially to inspect the famous mines of this locality, we are not prepared to give a detailed account of operations. A reduced force of men have been at work on the Stayton mines, and those of the Consolidated Wonder company all winter running tunnels, sinking shafts, etc., and developments are of the most satisfactory character. The richness of several of the leads in the Stayton group was substantially revealed several months ago, placing them beyond question in the first rank of quicksilver deposits; and any doubts that were entertained regarding the practical value of the Consolidated Wonder mines have been dissipated by the rich and promising strike of metal recently made in the Victoria tunnel. The future prospects are very encouraging indeed, and those who own stock in this corporation, we think, may rest satisfied that they have something worth holding on to. The Comstock and other prospects in that range also are looking well. A new furnace will soon be built on the Stayton mines and also on the Consolidated Wonder; and judging from the quantity of ore in sight, the Coast range mines of San Benito county will contribute to the world's supply a good share of quicksilver this summer.

BULLION DEPOSITORIES IN MINING DISTRICTS. The bill to utilize the products of American gold and silver mines, introduced by Congressman Banks a few days ago, commands itself to us a sensible measure. It provides that the Secretary of the Treasury shall establish in the great mining districts of gold and silver additional depositories and refineries, and receive from the miners and owners gold and silver, to be coined upon the certificate of a Government assayer, and issue a certificate of deposit therefor, payable to bearer, for such sums as depositories may desire; and when issued for more than \$500 on a certificate, may be made payable to order. Each certificate shall promise a return of the amount of gold and silver called for by the certificate, and shall be a legal tender in all transactions, the Government to be liable for the safe keeping of the gold and silver, and may become owner thereof by obtaining certificate through purchase or redemption. The Secretary is authorized to issue similar full-value certificates for coin that now or may hereafter be in the Treasury, reserving coin for their redemption.—*Ex.*

USEFUL INFORMATION.

Things Which it is Well to Know.

Irish stew is a dish never seen in Ireland.

Cat-out is not the gut of a cat, but of a sheep.

Kid gloves are not kid, but are made of lamb skin or sheep skin.

Arabio figures were not invented by the Arabs, but by the Indians.

Tuberose is no rose, but the tuberous palanin (*Polygonum tuberosum*).

Salad oil is not oil for salads, but oil for cleaning callets or salades—i. e., helmets.

Slave means noble, illustrious; but the term is now applied to the most ignoble and debased.

Black lead does not contain a single particle of lead, but is composed of carbon and iron.

Turkish baths are not of Turkish origin; nor are they baths at all. They are hot air rooms.

Salt is not salt at all, and has long been wholly excluded from the class of bodies denominated salts.

Cleopatra's Needle was not erected by Cleopatra in honor of that queen, but by Rameses the Great.

Prussian blue does not come from Prussia, but is the precipitate of the salt of protoxide of iron with prussiate of potassa.

Brazilian grass does not come from Brazil, or even grow in Brazil; nor is it grass at all. It consists of strips of palm leaf, and is chiefly imported from Cuba.

Whale-bone is no bone at all; nor does it possess any properties of bone. It is a substance attached to the lower jaw of the whale, and seems to strain the water, which the creature takes up in large mouthfuls.

Sealing wax is not wax at all; nor does it contain a single particle of wax. It is made of shellac, Venice turpentine, and cinabar. Cinabar gives it the deep red color, and turpentine renders the shellac soft and less brittle.

Burgundy pitch is not pitch, nor is it manufactured or exported from Burgundy. The best is a resinous substance, prepared from common frankincense, and brought from Hamburg; but by far the largest quantity is a mixture of resin and palm oil.

Buttons from Pebbles.—Immense quantities of buttons, manufactured from pebbles, are produced in Paris, and sent to almost every part of the globe. These pebbles, which are of crystallized felspar, containing as little clay and lime, or lime salts as possible, are reduced to powder by heating them to cherry red and then plunging them into cold water. The powder is separated from its impurities by being passed through a wire gauze sieve, and is next well stirred in water. The residuum is treated with a quantity of hydrochloric acid, varying from three to 10 per cent., to free it from the oxide of iron, which would give the buttons a reddish hue in the baking process. One hundred pounds of powder are mixed with two of chloride of sodium and four of flour paste, dissolved in five quarts of water; the whole is then passed through the sieve, and dried to a proper consistency for molding.

Brightening Iron.—When taken from the forge or rolls, the articles are placed in dilute sulphuric acid, (1 to 20,) then washed clean with water and dried with sawdust; they are then dipped for a second or so in nitrous acid, washed carefully, dried in sawdust, and rubbed clean. It is said that iron goods thus treated acquire a bright surface, having a white glance, without undergoing any of the usual polishing operations. It is stated that the action of the sulphuric acid is increased by the addition of a little carbolic acid, but it is difficult to see what effect this can have.

To Take the Rust off a Plowshare.—Take a quart of water and pour slowly into half a pint of sulphuric acid. The mixture will become warm from chemical action; put it on the iron and let it remain there until it evaporates. Then wash it again. The object of this is to give the acid time to dissolve the rust. Now wash with water, and you will see where the worst spots are. Apply some more acid, and rub on those spots with a brick. The acid and the scouring will remove most of the rust. Then wash the mold-board thoroughly with water to remove the acid, and rub it dry. Brush it over with petroleum or other oil, and let it be till spring.

Glass Cement.—A cement to stop cracks in glass vessels, to resist moisture and heat, is made by dissolving casein in a cold saturated solution of borax. With this solution paste strips of hog's or bullock's bladder, softened in water, on the cracks in the glass, and dry at a gentle heat. If the vessel is to be heated, coat the bladder on the outside, just before it has become quite dry, with a paste of a rather concentrated solution of soda and quicklime or plaster of Paris.

Black Pepper is made by grinding the dried berry of a climbing vine native to the East India. White pepper is obtained from the same berries freed from their husk and rind. Red or cayenne pepper is obtained by grinding the scarlet pod or seed vessel of a tropical plant that is now cultivated in all parts of the world.

PETROLEUM AS A LUBRICANT FOR TURNING TOOLS.—Considerable comment has appeared of late in foreign mechanical journals relative to the use of petroleum as a means of facilitating the action of turning tools in operating upon very hard alloys. A writer in *Les Mondes* states that a mixture of seven parts zinc, four copper and one tin, resisted all tools even when the latter were tempered to extreme hardness. As soon, however, as the cutting edges were moistened with petroleum, the alloy immediately yielded and was turned without difficulty. It is also said that, by using a mixture of petroleum and turpentine, steel annealed to straw yellow can likewise be turned. We know of no direct practical confirmation of this, but should be glad to hear from any of our readers who may test the suggestion. Meanwhile we shall experiment for ourselves, and note the result as soon as perfected.—*Scientific American*.

A NEW NICKEL PLATING SOLUTION, said to yield beautiful results, is prepared by mixing the liquid obtained by evaporating a solution of one-half ounce nickel in aqua regia to a pasty mass and dissolving it in one pound aqua ammonia, with that obtained by treating the same quantity of nickel with a solution of two ounces cyanide of potassium in one pound of water. More cyanide renders the deposit whiter, and more ammonia renders it grayer.

ENGLASS CEMENT.—Mix ground white lead with as much finely powdered red lead as will make it the consistency of soft putty. Another is to mix equal parts of white lead and red lead, and as much linseed oil as is required to give it the proper consistency; or boiled linseed oil and red lead mixed into a putty. These cements are used for making metallic points round.

IS LAMPGLASS SOLUBLE?—The substance known as lampglass always contains more or less resinous and tarry matters, that are soluble in oil of turpentine, benzine, naphtha, etc.; but the purified lampglass (carbon) is itself insoluble in any menstruum.

HOW TO MARK TIN CANS WITH A PEN.—Squeeze the juice of a lemon into a china or porcelain cup, and put in a small bit of copper. Let it stand for a day or two, then use it with a quill pen as with ink.

A FRENCH chemist has taken out a patent for making ink for printing, lithographing, etc., from the heavy oils and residuums of petroleum. He claims that ink made from these oils possesses great advantages over other kinds.

INDIAN OR CHINESE INK is formed of carefully purified lampblack and size, or animal glue, with the addition of perfumes, not necessary, however, to its use as an ink.

GOOD HEALTH.

Colored Light as a Cure for Insanity.

Dr. Ponza, director of the Insane asylum at Alessandria (Piedmont) having conceived the idea that solar rays might have some curative power in diseases of the brain, communicated his ideas to Father Secchi, of Rome, who replied: "The idea of studying the disturbed state of lunatics in connection with magnetic perturbations, and with colored, especially violet light of the sun, is of remarkable importance." Such light is easily obtained by filtering the solar rays through a glass of that color. "Violet," adds Father Secchi, "has something melancholy and depressing about it, which, physiologically, causes low spirits; hence, no doubt, poets have draped melancholy in violet garments. Perhaps violet light may calm the nervous excitement of unfortunate maniacs." He then, in his letter, advises Dr. Ponza to perform his experiments in rooms the walls of which are painted of the same color as the glass panes of the windows, which should be as numerous as possible, in order to favor the action of solar light, so that it may be admissible at any hour of the day. The patient should pass the night in rooms oriented to the east and south, and painted and glazed as above.

Dr. Ponza, following the instructions of the learned Jesuit, prepared several rooms in the manner described, and kept several patients there under observation. One of them, affected with morbid taciturnity, became gay and affable after three hours' stay in a red chamber; another, a maniac who refused all food, asked for some breakfast after having stayed 24 hours in the same red chamber. In a blue one, a highly excited madman with a straight waistcoat was kept all day; an hour after he appeared much calmer. The action of blue light is very intense on the optic nerve, and seems to cause a sort of oppression. A patient was made to pass the night in a violet chamber; on the following day he begged Dr. Ponza to send him home, because he felt himself cured; and, indeed, he has been well ever since. Dr. Ponza's conclusions from his experience are these: "The violet rays are, of all others, those that possess the most intense electro-chemical power; the red light is also very rich in caloric rays; blue light, on the contrary, is quite devoid of them, as well as of chemical and electro-chemical. Its beneficent influence is hard to explain; as it is the absolute negation of all excitement, it succeeds admirably in calming the furious excitement of maniacs."

Eat Celery.

We notice with satisfaction that celery is becoming more common and cheaper in our markets; its cultivation cannot be too strongly recommended to farmers, as by its production they not only grow a profitable plant, but confer a favor on the community, as the habitual daily use of this vegetable is much more beneficial to man than most people are aware of.

A writer who is familiar with its virtues says: "I have known many men, and women too, who from various causes had become so much affected by nervousness that when they stretched out their hands they shook like a-p-n leaves on a windy day, and by a moderate daily use of the blanched footstalks of celery as a salad they became as strong and steady in limb as other people. I have known others so nervous that the least annoyance put them in a state of agitation and they were in constant perplexity and fear, who were also effectually cured by a moderate daily use of blanched celery as a salad at meal time. I have known others to be cured of palpitation of the heart. Everybody engaged in labor weakening to the nerves should use celery daily in the season and onions in its stead when not in season."

To this we may add that a prominent New York druggist draws in winter from his soda fountain a hot extract of celery, mixed with Liebig's meat extract, under the name of ox-celery. It is a nourishing drink at lunch time, far better than coffee or tea, and is doing a great deal in this neighborhood to promote temperance. Diluted drinks are no better for a man than a whip is for a horse to make him work; oats are better than the whip, nobody will deny that, and to keep up the strength of a human being ox-celery or beef tea is better than whisky, but this fact many do not appear to know or realize.

But to return to celery. We give it almost daily to our canary birds and it cures them of fits; they are little animals, with very delicate nerves, easily frightened, and therefore they need such a remedy very much, and the relish with which they take it is a proof that their instinct guides them to eat what is good for them.

A manufacturer of perfumery of our acquaintance some years ago commenced to prepare an extract of celery seed, put up in bottles, and intended to give strength to old or exhausted persons, who, by over-indulgence, have reached such a state as to require restoratives.—*Boston Jour. Chemistry*.

Health Maxims.

We breathe in sleep about 15 times every minute.

If the bowels are loose lie down in a warm bed, remain there and eat nothing until you are well.

Do not allow yourself to read a moment in any reclining position, whether in bed or on a sofa.

Never swallow an atom of food while in a passion, or if under any great mental excitement, whether of a depressing or elevating character; brute won't do it.

The importance of wholesome water and good sewerage to every angle dwelling cannot be over-estimated, and any city neglecting this vital matter must expect to suffer at all times, and particularly when an epidemic of any kind sweeps over the country.

To be able to lie down at night and fall to sleep within ten minutes, and to know no dream or waking until the morning comes, and then to bound out of bed full of health, freshness and good humor, is a blessing well worthy the warmest outpourings of a thankful heart towards Him who giveth us all things richly to enjoy.

The great regulator of sleep is exercise; it is the best antidote in the universe, and it is the only one that is always wholesome and natural. If you cannot take much exercise, take a little, and every second hour increase the distance, and soon you will be able to walk a mile more easily than you walked the first hundred yards.

If an action of the bowels does not occur at the usual hour eat not an atom until they do act, at least for 36 hours; meanwhile drink largely of cold water or hot tea, and exercise in the open air to the extent of a gentle perspiration, and keep this up until things are righted; this one suggestion, if practiced, would save myriads of lives every year, both in city and country.—*From Dr. Hall's Maxims*.

SHAMPOONING (SCALPINO).—An intelligent writer in the *Chicago Tribune* protests against the practice of shampooing. He says this repeated application of stimulating washes destroys the hair, and is almost equivalent to scalpings. He is surprised that there are any men with full heads of hair left, and advises all young men to discontinue this pernicious practice.

Put some extra hedging on the foot of the bed at night to give the feet added warmth, and to be drawn up higher if needed before morning. The feet need special attention, as one of the best rules of health is to keep the head cool and the feet warm. Don't encourage cold feet by wearing shoes a size too small, for this will check the circulation.

A DOCTOR, on calling upon a gentleman who had been some time ailing, put a fee into the patient's hand, and took the medicine himself which he had prepared for the sick man; he was not made sensible of his error till he found himself ill and the patient getting better.

DOMESTIC ECONOMY.

Vegetables.

All green vegetables should be as fresh as possible. Put them into cold water with some salt in it, for about ten minutes, to clear from soil or insects. If not quite fresh let them remain in the water some time longer; drain in a colander and put them into a pan with plenty of boiling water, adding salt and a small piece of soda; cover the pan till boiling, but not afterward; then boil quickly, and carefully remove any scum which may rise. Do not allow them to remain in the water after they are done, but immediately drain them in a colander and finish each kind, as directed in recipes. Peas and spinach do not require so much water as most other green vegetables, but only just sufficient to cover them. Cauliflowers and brocoli require especial care in boiling, as the flower is easily broken and their appearance spoiled; boil them quickly for a few minutes, and then moderately till tender, which may be easily ascertained by trying the stem with a fork. All vessels used in cooking vegetables should be particularly clean. Soft is preferable to hard water in cooking all kinds of vegetables. Potatoes are in universal use, and yet how few know how to cook them well! "A well boiled potato is a thing purely ideal—it has never come out of the pot, in the experience of living man." This is too strong; but there is very much room for, and need of, improvement in the science of cooking a potato. To do it well, the matter must be studied, and not performed by routine. They differ very much, even those grown in the same field and from the same seed. A good potato, well cooked and served up, is a luxury, which, unfortunately, few people know how to accomplish, or will not give themselves the trouble to do.

Choice of Milk.

Cow's milk differs greatly in quality, some being rich and other thin and watery. In choosing a family cow it is well to hear this in mind, and select only those that are healthy and give the very best milk. They should also be fed on the best of food and allowed pure soft water to drink. The practice of feeding cows on garbage, swill slops, distillery feed, and of keeping them confined in close, filthy, unventilated stables, is one which seriously deteriorates the milk and should ever be avoided.

Those who live in cities cannot of course keep cows, and so they must depend on the market for their supply of milk. In such cases insist on having the best article and refuse to use that from distillery-fed cows, or that diluted with water. A little attention to this subject will enable any one to secure a good article. It is the laxity of purchasers of food in not demanding the best that makes it so easy for the dealer to palm off adulterated and inferior articles upon thoughtless people. If the poor would do this it would improve their own and their children's health wonderfully. The milk supply of a city has a great deal of influence for good or evil on the health of the children. In England this question is getting to be a very important one. The *Food Journal* says that "perhaps the most serious and destructive change in the nutrition of the poor is their almost total privation of milk. Infantile sickness and mortality depend largely on this want." There the occupation of mothers in factories and work shops deprives many thousands of infants of their natural food—breast milk.

FRENCH HOUSEHOLD ECONOMY.—The French butcher separates the bones from his steaks, and places them where they will do his most good. The house wife orders just enough for each person, and no more, even to the coffee. If a chance visitor drops in, somebody quietly retires, and the extra cup is so provided, but nothing extra by carelessness of intention. When the pot has boiled, the handful of charcoal in the little range is extinguished, and waits for another time. No roaring stoves and red-hot covers all day long for no purpose but waste. The egg laid to day costs a little more than the one laid last week. Valves are nicely estimated, and the smallest surplus is carefully saved. A thousand little economies are practised, and it is respectable to practice them. Cooking is an economical as well as a sanitary and gustatory science. A French cook will make a franc go as far as an American housewife will make three, and how much hotter than the American Bridget nobody knows—we should probably be greatly astonished, could the computation be made, how much of the financial recuperative power of France is owing to her soups and her cheap food; better living, after all than the heavy bread and greasy failure of our culinary ignorance.—*Springfield Republican*.

A soon cook is not the one who uses the most and richest ingredients, regardless of the expense; but she who audits economy, and is able to concoct a delicious meal from scanty materials.

EGG SANDWICHES.—Boil fresh eggs five minutes; put them in cold water, and when quite cold peel them, and after taking a little of the white off each end of the eggs, cut the remainder in four slices. Lay them between bread and butter.



W. B. EWER.....SENIOR EDITOR.

DEWEY & CO., Publishers.

A. T. DEWEY, GEO. H. STROGO,
W. B. EWER, JNO. L. ROONROffice, No. 224 Sansome St., S. E. Corner
of California St., San Francisco.

Subscription and Advertising Rates:

ADVERTISING RATES.—1 week. 1 month. 3 months. 1 year.				
Per line.....	.25	.80	\$2.00	\$5.00
One-half inch.....	\$1.00	3.00	7.50	24.00
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THE ORIGINAL ARTICLES in this paper are mostly set in solid type, giving in our columns one-third more reading than is contained in ordinary leaded matter.

Our latest forms go to press on Thursday evening.

San Francisco:

Saturday Morning, April 8, 1876.

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NEW ADVERTISEMENTS.

Mining Sales—Golden Sun Gold Mining Company; Josephine Grand Mining Company, Assessment—Lady Frank in Gold and Silver Mining Company.

CALIFORNIA OLIVE OIL.—One of the New York dailies remarks that it may not be generally known that a considerable quantity of California olive oil is finding an appreciative market there, and is coming into quite general use in hotels and restaurants. Samples of the oil were recently submitted by a prominent restaurant keeper to a party of his patrons, who were good judges of the article, for an opinion. After critically testing it, they unanimously reported it a first-class article, and were much astonished on being informed that it was of California production. The article is put up by parties at Los Angeles in cans and cases, and is sold in New York at a slight reduction from the rates of imported oil. Owing to the prejudice against home products, the agents have been obliged to label it Plagniol, a well known French brand.

AIR CURRENTS.—At the Sutro tunnel they have one of Cassel's air meters, a portable gauge for measuring the velocity of currents of air in mines, ventilating flues, etc. By this instrument the speed of the air in the tunnel was measured last Wednesday. The Independent says: At shaft No. 2, 100 feet per minute, or 1.13 miles per hour. At shaft No. 1, west side, 270 feet per minute; east side, 125 feet per minute; at mouth of tunnel, 35 feet per minute.

The Emma Mine Scandal.

Rumors of rich strikes in the Emma mine have been again and again industriously circulated, and needy men, calling themselves miners, have addressed letters to some of the English vendors complaining of the management of the mine and offering their services to superintend the mine for them. One of the American vendors, who made a large fortune by the sale of the mine to the English dupes, is reported to have claimed that the new company had employed an incompetent superintendent, and that the mine was shockingly managed. In an interview with a newspaper reporter this gentleman says:

"While going on well, and with excellent prospects, they struck a fault in the mine, the same as striking a flat wall. Instead of following down on the seam to another body of ore, they ran through the drift and quit. Another company, known as the Bay City, has run a tunnel in from Alta, and found a fine body of ore within the Emma, but below, said to be of a higher grade than that in the upper workings of the mine. This should have been found by the Emma mine people, according to the ordinary rules of mining, within 60 or 90 days of the time of finding the fault. In that event the stock would have suffered very little on account of the discovery of the break."

The above conveys, or is apparently designed to convey the idea, that there was ore left in the mine to work. On the other hand, men of unquestionable integrity, such as Mr. Clarence King, Mr. Andrew Murray, of London, Mr. Blackwell, Prof. Blake, Mr. Attwood, and a host of others, after a very careful examination of the works, report the great Emma bonanza to be worked out. In the first report of Prof. Blake, made July, 1871, it appears that the mine was nearly worked out. In that report the Professor said:

"At the present rate of extraction the mine will soon be stripped, and, for the present, practically exhausted, at least for some time, or till another body of ore can be found."

This paragraph, and so much of the report as related to the matter of the mine being exhausted, appears from a report of the English directors, dated April 29th, 1875, to have been "carefully suppressed," until after the sale.

In support of the correctness of the report of Prof. Blake, we give the following brief extracts from other reports made to the English company after they had effected their purchase: Clarence King, under date of June 11th, 1873, said: "The great Emma 'bonanza,' the object of such wide spread celebrity, the basis of such extravagant promises, is with insignificant exceptions worked out, and the future of your company is hung on a mere geological chance, which may be eternally against you; and if in your favor may only be secured by the wise expenditure of time and money."

Andrew Murray, F. L. S., London, Aug. 15th, 1873, said: "In my opinion, the famous Emma mine is exhausted, and nothing more is to be expected from it but the leavings of the old workings."

Mr. Blackwell, manager of the Ophir mining and smelting company, Uist, reports, June 7th, 1873: "The future of the mine depends entirely upon virgin ground, and to explore this you must be prepared to wait some time and spend a large amount of money in developments."

Mr. Attwood, in his report of April 30th, 1874, says: "The future chance of finding a new deposit of ore rests most undoubtedly on a geological problem; but as long as you have any funds in hand I do not think your property should be abandoned, but explorations carried on, as I have advised, and that, too, in a careful and economical manner."

Much has been said and great hopes have been expressed by the vendors, of the chances of finding another deposit of ore in the claim.

We have made enquiries of competent parties conversant with the claim, and the answer given to us was nearly in these words: "That the enclosing rock of the Emma mine deposit was a bed in lower silurian limestone, the deposit having the same strike and dip as the enclosing rock. That though called a vein or lode by some, that it could hardly be termed such according to the generally accepted meaning of the word. That it had no foot or hanging wall so specially characteristic of true veins or lodes, and that the ore bearing character of the deposit gradually disappeared in depth, and on either side, and that the limestone forming the main bulk of the gangue increased by degrees till at last it merged into the unaltered limestone rock; consequently there is no ore left to work, and the chances of finding another deposit anything but encouraging. Had it been a true vein or lode, a fissure, die, or caving the limestone beds, and causing a displacement of them, with well defined walls, like the large lead veins in the limestone formation of the north of England, it would have been different and the prospect of meeting with more ore good."

A MARL DEPOSIT IN KENTUCKY.—Kentucky has just struck a bonanza in the shape of the discovery of a vast bed of marl, which, it is said, underlies an area of some twelve thousand square miles, mainly that part of the State where it appears to be most needed, the tobacco-growing counties. Twelve thousand square miles is nearly one-third the area of the entire State.

Gems and Precious Stones.

(Written for this Press by HENRY G. HANES.)

(Continued from last week.)

A.—Diamond, Jet and Cannel Coal.

The diamond is pure carbon crystallized. Chemically it does not differ from charcoal, and is also nearly identical in composition with graphite.

It is the hardest of all known substances. Its specific gravity is 3.529 to 3.55. Diamonds are not always colorless, and this fact renders their determination difficult. They are sometimes tinged yellow, red, orange, green, brown, blue, rose red and often black. When the color is decided they are more valuable than when limpid. When light colored, they are said to be "off color." The fracture of the diamond is four-fold, parallel to the faces of the octahedron. The fragments are octahedral or tetrahedral. It strikes fire with steel, surface often rough or striated, sometimes covered with a scaly crust. The touch of the diamond is cold. When the cut gem is breathed upon the luster is lost for a moment, when defects are seen.

Diamonds found in river beds are generally in rolled masses, while those found imbedded in the formations peculiar to their locality are covered with an earthy pale gray, yellow, or rose-red coating. The texture of the diamond is lamellar.

The diamond exhibits a beautiful play of colors in the direct rays of the sun, or bright artificial light. To its luster has been given the name of "diamond luster," or "adamantine luster." Its refraction is simple, but it possesses this power in a higher degree than most other minerals of equal specific gravity. In consequence of its extreme hardness, it can only be cut by its own powder. The common saying, "Diamond cut diamond," is exceedingly expressive.

When the diamond is rubbed, it becomes positively electrical, even before being cut, in which it differs from all other gems. When, after exposure to direct sunlight, it is suddenly placed in darkness, it shows phosphorescence, and the evolution of light continues for some time. It is not acted upon by any acid or alkali. But it may be consumed and completely oxidized to carbonic acid at a high heat in the atmosphere. It is so difficult to burn that the ordinary blow-pipe flame has no effect upon it. It may be heated to whiteness in a closed crucible without change, but it begins to burn in a muffle at the melting point of silver. At a high heat with nitrate of potash it is rapidly decomposed.

Miners are generally not familiar with the appearance of diamonds in the rough state, and would most likely mistake them, if found, for chalcedony or some similar mineral. If in crystal form, it would be to them a crystal only—interesting for the moment, to be soon thrown aside as useless. I have heard of a case where a beautiful crystal, supposed to be a diamond, being found in some placer mine in California, was put to the following test: It was placed on an anvil and struck a heavy blow with a sledge hammer, it being assumed that the diamond, being the hardest of known substances, could not be broken. This idea is more ancient than is generally supposed. The statement has been made by Pliny, but it is doubtful if he ever made the experiment himself. In speaking of adamas, he says that it cannot be crushed, but would split hammers and anvils in the attempt.

It is certain that this is a mistake. The diamond can be split on the edge of a knife, and even a light blow with a hammer might destroy the most costly gem.

The diamond is supposed to be of vegetable origin, and is believed, by those who have studied it carefully, to be produced by slow decomposition of vegetation or bituminous matters. It is generally colorless, but always transparent (except in case of the black diamond, which is opaque,) generally crystallizes in octahedrons, but often found in rounded masses, occasionally in curious irregularly concretionary forms, like chalcedony or semiopal. Frequently the faces of the crystals are curved, sometimes they take a nearly spherical form, having 48 faces.

It requires practice to judge of the diamond in its rough state. A rough diamond of the first water would be hardly recognized by the uneducated eye as a valuable gem. In describing the diamond, many of its characteristics are visible only in its cut state. Half the stone is sometimes cut away before a perfect gem can be produced. The diamond washers of Brazil rub the stones together and produce a peculiar grating sound, from which they assume to judge of their value.

There is a peculiar appearance about a rough diamond which can hardly be described. I question if any written description would convey to the reader a correct idea of what they are exactly like. It is easy to say that they possess a peculiar luster, like spermaceti, but who would feel certain of the identity of a diamond from such a description. Once seen, this peculiar luster becomes impressed on the mind. To educate the eye, models of rough diamonds are made at Amsterdam for the use of prospectors, and they are found extremely useful.

The diamond has been found massive in Brazil. In this form it cuts glass, scratches quartz and topaz. Has a specific gravity of 3.27 to 3.52, and is nearly pure carbon, being completely consumed in oxygen gas. It occurs in kidney-shaped, irregular masses, exterior generally black, sometimes resembling graphite,

has a somewhat resinous luster, sometimes takes very singular forms. The outer coating black and resinous, interior crystalline, vitreous and lamellar, like the diamond. It has been used in powder to cut other diamonds. The diamond cutters call them "cheese stones."

A diamond may be burned away on a piece of platinum in the flame of a powerful blast blow pipe.

Sir David Brewster found cavities in the Koh-i-noor, and other large diamonds, with the microscope. Black diamonds he found to be opaque from a multitude of such cavities. One large diamond having a black spot in it was cut in two, and the defect was found to be vegetable mud enclosed in the crystals.

(To be Continued.)

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s Scientific Press American and Foreign Patent Agency the following are worthy of mention:

FURNACE FOR STEAM BOILERS.—Michael Laufenberg, S. F. This invention comprises a new arrangement for feeding straw to the furnaces of steam boilers and burning it as fuel for generating steam. It consists of a peculiarly constructed door which can be either applied in place of the ordinary furnace door, or it can be located directly in front of the grate bars and extend entirely across the front of the furnace. The grate bars are suspended on journals at or near the middle of the furnace, and their rear ends are weighted. The inventor then connects the door with the front ends of the grate bars so that whenever the door is opened and closed the grate bars will be shaken or jarred, while the weighted rear ends of the grate bars serve to close the door. The furnace front is cut entirely away from a line directly in front of the surface of the grate bars, downward. The sides and bottom of the furnace are also extended forward so as to form a projecting box in front of the furnace below the level of the grate. The front half of the grate bars projects far enough forward to have their front ends strike against the lower edge of the boiler front, where it is cut away. A door is placed at an incline directly above the box, so that its inner or upper edge will also rest upon the forward ends of the grate bars, while its outer or lower edge is pivoted to the sides of the box. A flange is screwed to the lower edge of the boiler front, outside of the furnace. This flange is inclined upward at an angle opposite to the angle of the door, and can be formed by merely turning a portion of the boiler front upward, thus forming a flaring or V-shaped approach to the doorway. The straw is fed to the furnace by placing it in the V-shaped angle between the door and flange, and by pressing it forward with a fork the upper end of the door is depressed, carrying with it the forward end of the grate bars until an opening is made sufficiently large to admit the straw. It is then pushed into the furnace with the fork, and as the fork is withdrawn the superior weight of the rear end of the grate bars will raise the forward end and close the door, the striking of the forward end of the bars against the lower edge of the boiler front producing a jar which will clear the bars from cinders. This construction enables the inventor to feed the straw to the furnace at any point in its width, whereas the ordinary door arrangement only provides a limited opening so that the straw is all fed in one place and creates a heap of cinders at that point, which prevents the proper burning of the straw by choking off the draft. By placing the door below the grate bars and feeding on a level with them, the fresh straw which is introduced disturbs the cinders and is fed directly into the hottest part so that it is readily burned. The vertical extensions serve to prevent the cinders and straw from being drawn into the flames by the draft, and in order to make them more effective, the inventor ordinarily employs stationary water pipes or tubes, which connect with the boiler and extend forward. These tubes will then serve as cleaning fingers, to clear the straw from between the grate bars every time a fresh charge is introduced. By this arrangement of the grate bars, the draft is preserved and an accumulation of cinders upon the grate-bars prevented. This same arrangement can be applied in place of the ordinary furnace door by connecting the inner end of the inclined door with the front ends of the suspended grate, by means of a rod connection extending down to the bars, in which case it can be used for feeding wood brush or other light fuel; or a vertically sliding door can be connected with the grate, so as to be closed by its weighted rear end.

CLEANING COMPOUND.—Margaret N. Cross, San Francisco. This invention relates to an improved compound for cleaning articles of gold, silver, and all polished surfaces of metal; also glass, marble and other substances. It consists in a combination of materials and a method of compounding them, so that the effect is produced of removing greasy or oily matter with a thorough polishing of the surface. In this compound that impalpability of the solid portions is secured which is so essential in any substance which is employed to clean polished surfaces.

SAW MILLS FOR THE BLACK HILLS.—Mechinaw for three complete saw mills has been shipped from a manufactory in Erie, Pa., to the Black Hills during the past month.

(Continued from Page 225.)

end of the bar, *d*, and to the outer end of this arm is fixed a swivel block, *4*, to which a tow strap is secured. This arm can be fixed at the desired position by a set screw, *e*.

When the body of the patient has been adjusted in the bed the sliding bar, *b*, is drawn out until the heel of the foot rests against the heel post. The sliding arm, *3*, is then moved to the proper place, to allow the ball of the toe to rest upon the block, *4*, and the strap is drawn around the foot and buckled, thus keeping the foot in proper position to prevent eversion without any rigid fastenings. The bar, *b*, will slide easily into its socket, in line with the leg of the patient, so that it can be moved longitudinally, but be prevented from moving laterally.

At the foot end of the measuring bar is constructed a drop bar, *7*, which is parallel with the bar, *S*, and attached rigidly to it at each end. This drop bar will come midway between the feet of the patient. A try-square is then used for determining whether the feet are in proper position or not, by placing one arm of the square upon the drop bar, *7*,—first upon one side and then upon the other—so that the opposite arm will stand at right angles to the bar, and thus give the exact measurement.

When the patient has been thus adjusted and his position fixed, if the fracture is of a leg bone, the well leg is attached by means of bandages, with one of the studs, *r*, on the sliding top, *m*, of the box, *Z*, which is in line with the foot. Weights of any kind are then placed in the bucket, *P*, of the box, until the leg is extended to its utmost. The square is then employed for the purpose of measuring the extension. The well leg is then released and the fractured limb is connected with the sliding top of its proper box, and the bucket of this box is weighted so as to extend the fractured limb until it is equal in length to the greatest extension of the well limb.

The counter extension is obtained by the foot of the bed being elevated so as to cause the weight of the patient to counterbalance the weight in the bucket. To do this, feet, *f*, are screwed into legs *B*, of the bed, so that by turning the screws the proper inclination can be given to the bed.

If the bandage on the limb becomes irksome, its position can be shifted by securing a second bandage in another place, and connecting it with two rear studs, *r*, which is made larger than the front one, to permit of the bandage being attached to it without interfering with the front stud. This is a very important point, as when this second bandage is properly adjusted the first one can be removed, thus changing the location of the bandage to the relief of the patient, but without in the slightest degree disturbing the extension of the limb.

In summing up the special advantages of this apparatus we can do no better than to quote the words of Dr. G. W. Dutton, of Tomales, who has used it in his practice, and writes a letter to the inventor, from which we make the following extracts: I have no hesitation in saying that it is the only thing of its kind that has a perfect adaptation to the treatment of fracture of the femur, according to the advanced principles which should be applied in the treatment of this lesion. These advanced principles are:

1st. Extension by weight and pulley; for the reason that the weight is always ready to take advantage of any stretching of the material intervening between the weight and injured limb, and of any relaxation of muscles which may have been in a spasmodic condition at the so called "setting" of the limb.

2d. Counter extension by the weight of the patient's body, applied by means of raising the foot of the bed; for the reason that the continuance of the "pe-inel band" (as in the ordinary method of treating these fractures), when tight enough to be of any use, produces pain and excoriation.

3d. The extension of the sound limb for a criterion in measurement; for the reason that in making the extension of the broken limb the ligaments of the knee and hip joints stretch before the muscles, in a spasmodic condition, allowing the broken bone to extend to its proper place; and if the broken limb is drawn out no farther than until it measures exactly what the sound limb does, without extension, there will yet remain a lapping of the fragments of broken bone.

4th. Measurement with an instrument by which the body of the patient is accurately straightened, and the same point on both sides of the pelvis placed equi-distant from the mesial line; for, in measuring with the tape (now the ordinary way), the surgeon guesses at the straightness of the patient's body and the squareness of the pelvis, and he is very likely to be incorrect.

Your arrangement for supporting the foot, and thereby, in some measure, preventing eversion, and for sustaining the weight of the clothes, and your arrangement for the evacuation of the bowels without soiling the mattress are, it would seem, perfect.

I also notice with admiration your ingenious method of changing the point of attachment of the extension on the injured limb, by which, during the time of such changing, the steady, even, continuous extension is preserved. This novel device will be of use in every ordinary case, in applying the adhesive strips and bandages.

The ease with which your bed can be transported, on account of its compactness, and of its fitting inside the carriage box of a spring wagon is of great advantage.

Sulpho-Carbonate Treatment of Vines.

A paragraph has recently been going the rounds of the press to the effect that the French had found an effective antidote for the ravages of the phylloxera among the grapevines, in the application to their roots of alkaline sulpho-carbonates. Our engraver has reproduced an illustration from an European publication, which was originally taken from photographs of two vines—one of which was treated with the remedy, the other left to the destroying insect.

The useful application to the cure of the attacked vines requires, first, that all the infested surface be treated; second, that the toxic action may be carried sufficiently deep in order to reach all the phylloxera. These two conditions combine for the complete destruction of the parasite. The best means of obtaining a perfect diffusion of the poison in the soil consists in the use of water as a vehicle. The quantity of water employed may depend upon the degree of humidity of the earth and upon expected rains; but the use of some water is necessary. From experiments conducted in France it appears that, to apply the sulpho-carbonate solution, square excavations should be made in the soil, about three inches deep and 30 inches wide. As all the infested locality must be treated, these holes should be made sufficiently near together that the earth partitioned between them shall become soaked after the liquid is poured in. The bottom of the excavation, it is hardly necessary to state, should



EFFECT OF SULPHO-CARBONATES ON VINES.

be horizontal, so as to afford the best opportunity for the solution to infiltrate uniformly into the earth; and this should be borne in mind when the natural level is inclined. The holes should be brought up close to the base of the vine treated. The above done, about two and two-third ounces of the sulpho-carbonate, at 40 degs. B., is mingled with any quantity of water, in the ordinary watering pot or other vessel, thoroughly mixed, and the whole poured into one hole. Repeat this for every hole made, the area covered by the whole number of excavations of course being that underlain by the roots of the vine. Then return the earth about the base of the vine and pour on plenty of fresh water, so that the poison will be forced deep down to the roots.

Our Illustration

Is to give an idea of the practical results of this treatment. The two feet of vines shown formed part of a single attacked part, in which the parasite had existed for three years, and they had reached about the last stage of the disease. In March, 1875, one-half of the selected group was treated with the chemical, the other left to its fate. In the treated portion it should be noted that, out of 260 vines, 60 were already dead. Up to July the vegetation of the vines, without growing any weaker, had not improved; and it was not until the beginning of August that the leaves began to grow green and the shoots to elongate. Meanwhile, the vines not treated were daily perishing. In October, two average vines, one from each portion, were selected and reproduced, as stated, by photography, for the purpose of the present illustration. The vine on the left has very short branches, and its radicular system is almost destroyed; it may be considered, in fact, as dead. That on the right, which was in similar condition to the other before treatment, is evidently considerably improved, new shoots appearing and new roots being thrown out, so that it may be predicted that by next year it will have regained its former vigor.

Our Reporter Abroad.

Dutch Flat.

The charm of mystery which attends quartz mining attracts to it usually more attention than is given to hydraulic mining, which is almost entirely on the surface and in sight, but the ingenuity of the appliances and the magnitude of the operations at this place cannot fail to interest. It has become, owing to the improvements in the process, comparatively easy to wash away entirely the immense channels of gravel and rock from which the surface earth was long since removed by the older and incomplete methods, and mines of wealth denied to the earlier workers are brought now within easy reach.

No mining section in this State has a more assured future than this. The work to be done is plainly in sight and the means of doing it accurately calculated and well controlled. Ultimately, the gravel deposits will of course be washed off to the bedrock, but hardly in 50 years to come. Hence, Dutch Flat looks ahead with much complacency to a long continued period of prosperity. Almost all the companies and firms at work here are under the management of men who are experienced in this kind of mining, and seem to have ample

he surplus, and one, the Yuba ditch company, does no mining at this point.

The Cedar Creek is an English company, under the management of Col. T. B. Lindrum, and is the pioneer of deep hydraulic mining. They own about thirty claims, some of which are in the Gold Run district, and are washing now at five different places, using about 4,000 inches of water. A long tunnel, about 3,000 feet, is projected, and a large part of it completed and now in use. This tunnel is intended to reach the whole of the company's claims in its vicinity, and will be entered through four different shafts. Their Burleigh drill is driven by water (which is the only motive power used by this company), and works its way with great rapidity through an exceedingly hard trap rock. About 60 miles of ditch brings water from the American river and its tributaries for their own use and for sale to other companies.

The Franklin company, of which Mr. James Tesf is superintendent, is washing at present about five hours a day. Their shaft is yet 60 feet in gravel and about the same distance through the bedrock. A stratum of hard clay impedes the work just now, compelling great caution that the sluices and shaft may not be filled in with this tenacious material. Much hard work is required to put it in shape to be washed off. This company owns no water and is supplied by the Cedar Creek company.

Mr. John S. Colgrove has the management of the Polar Star, which is a consolidation of a good many original claims. They are now just ready to wash through one tunnel of about 600 feet, and have a longer one approaching completion. The tunnels are run by contract for them by the Gold Run ditch and mining company, which method they preferred to purchasing the drilling machinery. Instead of the usual wooden blocks used for that purpose, the rille in the tunnel has been laid with old railroad iron and filled in with rock. This is an original idea of the superintendent, and is of course experimental, but he and others seem to have no doubt of its success. At the mouth of the tunnel, a grizzly also made with railroad iron has sufficient incline to carry off all the large boulders, while the water with all the smaller material falls through the bars into a box and goes thence into the flume. The large pieces as well as all the tailings are discharged into Bear river canon at a point 350 feet above the bed of the river, thus providing ample room for the accumulations of years. The company will probably be working through their second tunnel by July 1st. Their supply of water comes from the Yuba company's ditch and will be ample as soon as some breaks are repaired that were caused by recent snow slides.

At Gold Run.

The Gold Run ditch and mining company, Mr. J. L. Gould, superintendent, are washing at two points in their large claim, with a good supply of water. Their water comes from the Yuba and Bear rivers, and is used altogether in their own mines. They expect to have a liberal supply of water this season, as do all the ditch companies, from the unusually large quantity of snow in the mountains. This company was the first to introduce the Burleigh drill into this section, and besides running long tunnels in their own claim, have contracts to tunnel for others. Their main tunnel and branches aggregate over 2,000 feet. A branch connects their main tunnel with the Gold Run hydraulic company's claim, who consequently have the same outlet. The last named is an English company, under the management of Mr. James Stone. Their washing was stopped on the 24th by a closing up of the shaft, but they think the obstacles can be readily removed and that they will resume in a few days.

The claim of Messrs. Hoskins in this district is also temporarily out of water on account of the break in the Yuba ditch, but are daily expecting to be under way.

The Cement mill company is the only other company now at work in the Gold Run district. Theirs is not hydraulic mining, but consists in drifting into the hard stratum and treating this deposit in an eight-stamp mill run by water power. Of course all the deposit above the cement is left, and as portions of it are rich in gold it will inevitably be washed away at some future time by the hydraulic process.

At Dutch Flat, the claims worked by Messrs. Staples, Mr. B. Huysink and Mr. J. H. Decamp, are not the property of incorporations, but are owned and operated by themselves. The Messrs. Towle Bros., who conduct a large business in lumber, have their office and headquarters here, though their nearest mill is several miles distant, and their shipping point farther west. The annual product of their mills is from 10,000,000 to 12,000,000 feet, three-fourths of which finds a market over the mountains, some going as far east as Salt Lake. A railway connects all their mills with the planing mills and the shipping point. An ingenious and successful device has been adopted by them for getting logs up the precipitous mountain sides. A railway track is constructed upon which loaded cars are drawn up the incline, sometimes at an angle of 22 degrees, by a stationary engine at the summit. The wire rope which makes the attachment to the car is wound around a drum 16 feet long, and an adjustable feed, which is an invention of their own, distributes it equally along the drum, so that there is no friction of one coil of rope against another. The track on the incline has the same gauge as their main railway, and thus the cars may be forwarded without unloading to their destination.

Dutch Flat, Mar. 31st.

Persons engaged in the following business can have their Signs Painted at contract prices, for goods or articles in which they trade, viz:

Merchant Tailors,	Gents' Furnish'g G'ds,
Bootmakers,	Furniture Dealers,
Hatters,	Jewelers,
Hotels,	Piano Fortes,
	Wine Merchants. Etc., Etc.

PACIFIC MACHINERY DEPOT,

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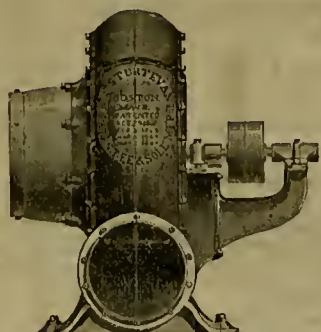
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COAST FOR

J. A. Fay & Co's Wood-
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Pumps,

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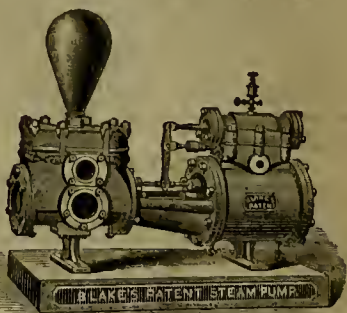
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Nathan & Dreyfus' Glass
Oilers, and Mill and
Mining Supplies
of all Kinds.

BLAKE'S PATENT STEAM PUMP



Over 8,500 in Successful Use in the United
States.

ENRIGHT'S PATENT PORTABLE

Wood and Straw-Burning Engines.

Patented July 20th and November 2d. 1875

Burns Wood or Straw without change, and Coal by changing two plates. Took the Pre-
minm at the California State Fair, 1875, as the Best Straw-Burner.

Pioneer Builder of the First Portable Thresher Engine on
the Pacific Coast, 1861.

PATENTEE AND BUILDER

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Best Portable Straw or Wood Burning Thresher Engines, 1876.

Send for Testimonials and Price to

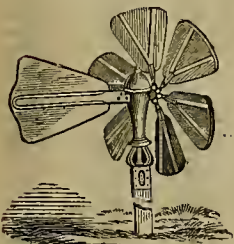
JOSEPH ENRIGHT, San Jose, Cal.

SHERIFF'S OFFICE, SACRAMENTO, Sept. 21, 1875.

Mr J. ENRIGHT—Dear Sir: The Straw Burning Engine I bought of you, and which was
used in Yolo County, has given us perfect satisfaction. It is everything you represented.
We have had no difficulty in generating all the steam required, and the amount of straw con-
sumed can hardly be missed. We find it much easier, on account of fire, than a wood-
burner. Many persons, both threshers and farmers, have come to see it run, and all express
themselves highly pleased. The opinion of all was, that it is just what we need, being safe
and economical.

H. M. LARGE.

AUTOMATIC PUMP.



Raises water by compressed air to any height or distance.
Windmill can be set at any distance from the
well or spring if required to get a good
exposure to the wind.

SEND FOR CIRCULAR.

J. E. HOLLOWAY, Gen. Agent for Pacific States,

31 Beale Street, San Francisco,

WHERE THE PUMP CAN BE SEEN IN OPERATION.

Glasgow Iron and Metal Importing Co.

Have always on hand a large Stock of

Bar and Bundle Iron, Sheet and Plate Iron
Boiler Flues, Gas and Water Pipe, Cast
Steel, Plow and Shear Steel, Anvils,
Cumberland Coal, Etc.

WM. McCRINDLE, Manager, 22 & 24 Fremont St., S. F.

\$5 to \$20 Per Day at home. Terms free. Ad-
dress G. STINSON & Co., Portland, M.

STOCKHOLDERS' MEETING.

Eureka Stone Manufacturing Company—

A Stockholders' Meeting of the above named company
for the election of Directors for the ensuing year, and
for the transaction of such other business as may
come before the meeting, will be held at the com-
pany's office, No. 207 Sansome street, San Francisco,
on Tuesday, the eleventh day of April, 1876, at 11
o'clock, A. M. WILLIAM HOOD, President.
P. D. MOWELL, Secretary.

IRON PIPE

FOR GAS, STEAM AND WATER,

Galvanized, Enameled and Black, 1-4 to 12 inch Diameter.

SEAMLESS

LAP-WELDED PUMP COLUMN,

ALL SIZES, TO 15 INCHES DIAMETER.

HYDRAULIC MINING PIPE,

GAS AND WATER MAINS.

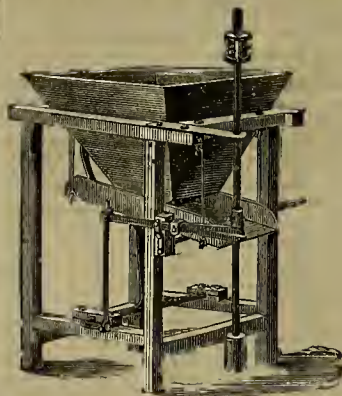
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DUNHAM, CARRIGAN & CO.,

107, 109 and 111 Front Street, San Francisco.

TULLOCH'S AUTOMATIC ORE FEEDERS

Increase the Capacity of each Battery Two to Three Tons per day.



SAVE LABOR! SAVE MORE GOLD!
SAVE SHOES AND DIES.

One Man Can Attend to a Hundred Stamps.

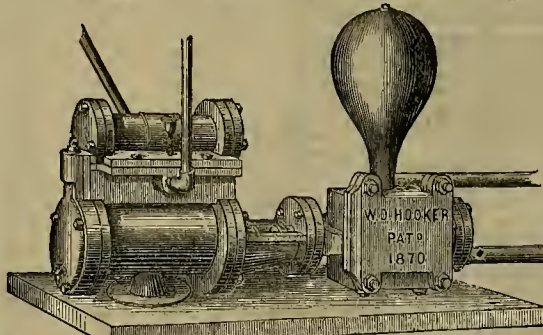
WILL FEED ANY KIND OF ORE,
WET OR DRY.

ARE DIRECT ACTING. EACH MOTION SCRAPES A POR-
TION OF THE ORE INTO THE BATTERY. CAN
REGULATE THE FEED. ARE SIMPLE AND
DURABLE. ARE IN USE IN CALI-
FORNIA, NEVADA, IDAHO AND
MEXICO. WARRANTED
TO WORK.

F. OGDEN, Sole Agent,

417 Market Street. S. F.

Hooker's Patent Direct Acting Steam Pump.



W. T. GARRATT,

Cor. Fremont & Natoma
streets, S. F.,

Sole Proprietor & Manu-
facturer for the Pacific
Coast.

SIMPLE, CHEAP AND
DURABLE.

Adapted for all pur-
poses for which Steam
Pumps are used.
The Best Pump in Use.

SEND FOR CIRCULAR

N. B.—Also manufacturer of Hooker's Deep Well and Double-Acting Force Pump. Received the Silver
Medal awarded at the last Mechanics' Fair in San Francisco.

SUTTER CREEK, February 26th, 1875.

MESSRS. DEWEY & Co.—I have received my Letters
Patent through your Agency. and, for your prompt
ness, accept my thanks. Yours,
S. N. KNIGHT.

THE MINING AND SCIENTIFIC PRESS is one the best
papers published on this coast. It should be in the
hands of every miner and mechanic in the State. The
issue of last week contained an excellent article on the
old product of this coast.—Oroville Mercury, Jan. 28.

[Continued from page 230.]

Utah.

THE TUCUMSEH.—Cor. Salt Lake Tribune, April 1: The Tucumseh is the location on Silver flat which has caused great excitement by the discovery of rich chloride ore. Thirteen tons and a half were shipped to Salt Lake in January, yielding \$440. The last shipment of 20 tons yielded from \$350 to \$750 per ton. This mine is owned by Judge Barbee and others.

THE BRONZA is situated 1,200 feet from the Tucumseh, and is the oldest location in Silver flat. The owners are engaged in stripping the ore, which shows assays from \$50 to \$500 in silver. They have shipped several tons to Salt Lake for a test of the sample value. The mine is owned by Forsyth & Robinson.

THE BRONZA is situated across the first ridge opposite Silver flat. They are engaged in stripping 30 feet on a body of ore showing considerable black sulphurates and chloride, assaying \$158 in silver, several tons of which are now on the dumps. Owned by Jos. Cochins & Co.

Idaho.

GOOD NEWS FROM THE POORMAN.—Idaho Avalanche, March 25: Superintendent Blodgett is now taking out a splendid quality of ore between the third and fourth level in the Poorman mine, south of the shaft. They have also struck a streak of rich ore in the cross-cut running east from the seventh level drift, at a point 350 feet north of the shaft, with flattering indications of soon tapping the main ledge directly under the fabulously rich deposit of ore worked out near the surface in early days.

ALTUS COUNTY MINES.—Our regular correspondent at Rocky Bar writes us that George P. Newton, on the 16th inst. brought over \$514 pounds out of specimen rock taken from this Last Chance mine. There was also taken out six tons of ore worth \$200 per ton, making about \$1,800 in all, realized from the work of three men in less than a month.

General News Items.

PREPARATIONS are rapidly being made for the Belknap impeachment trial.

THE present eruption of Mt. Vesuvius is said to be exceedingly grand.

FRANCE will interpose to relieve the financial embarrassment of the Khedive.

GILMORE will conduct the Centennial musical exercises on the 4th of July, at Philadelphia.

It is stated that Winslow, the Boston forger, will not be surrendered by the British Government.

JAPAN having ratified the postal agreement with the Government, it has now gone into effect.

THERE is a dead-lock between the Plymouth Committee and Henry C. Bowen, which it will be hard to break.

GREAT excitement exists in Kentucky over the discovery of gold on the farm of General Blackwell, in Clark county.

PRESIDENT GRANT is confined to his room and receives no visitors, though he is not confined to his bed. His sickness is periodical neuralgia.

THE House Committee on Public Lands will probably send a sub-committee to California after the present session of Congress, to inquire into alleged frauds in the California land office.

A SPECIAL from Washington says President Grant has sold his property known as Rhode Island farm, for which he paid over \$22,000, and on which he intended building a substantial residence this year. Having become disgusted with Washington life he will probably settle on his home near St. Louis. He is especially anxious to escape from hollow hearted Washington society.

THE River and Harbor Appropriation bill in Congress, reported to the House Monday by Hersford of West Virginia, appropriates in all the sum of \$5,872,850. Among the items are the following for the Pacific coast: Lower Willamette and Columbia rivers, \$15,000; Upper Columbia, including Snake river, \$10,000; breakwater at Wilmington, \$30,000; Sacramento and Feather rivers, \$100,000; Oakland harbor, \$75,000; San Joaquin river, below Stockton, \$20,000; Monterey harbor, \$12,000.

THE Canadian Government have announced their policy respecting the Pacific railroad, which is to ignore the 10 years limit and build it as rapidly as the circumstances will permit. The line has been located from the Lake of the Woods across Red river, via Fort Petty and Edmonton, through the Jasper House pass to Fort George, in British Columbia. The difficulty is to decide out the route from Fort George to the Pacific Coast, 300 miles. The Fraser river route has been abandoned as impracticable, so either the Butte inlet, 150 miles, or more likely Dean channel, 250 miles north of Victoria, on the Pacific Coast, will be adopted as the western end. At the eastern end it is not at all probable that any attempt will be made to construct the section from Lake Nepigon, north of Lake Superior and Lake Huron, to Nipissing for many years, so it may be looked on as practically abandoned, unless there be a change of government at the next general election in two years from now.

HOOVER MINE.—M. E. Ward, who is engaged in the stock business and has an extensive ranch at Granite Creek Meadows, near the Honey Lake road, informs us that a mining company has been vigorously prosecuting work for some time past on the Hoover ledge, which is situated in the Nightingill range, about 15 miles from the Hot springs, on the Honey Lake road. Mr. Ward says the prospects for developing a good mine are very flattering. Three shifts of men are employed in sinking on the lead, in which there is considerable ore of a high grade. Although several silver hearing leads have been discovered at different times in that section of Humboldt county, the Hoover company is the first to make a systematized effort to develop any of them, and it is sincerely hoped that it will be successful.—Silver State.

PATENTS & INVENTIONS.

A Weekly List of U. S. Patents Issued to Pacific Coast Inventors.

FROM OFFICIAL REPORTS FOR THE MINING AND SOLE TITIO PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.

By Special Dispatch. Dated Washington, D. C., April 4th, 1876.

FOR WEEK ENDING MARCH 21st, 1876.*

SEWING CASES.—Böhrt Philip and Louise A. Philip, Sacramento, Cal.

REISSUE.

SEWING MACHINE.—Eugens Moreau, S. F., Cal.

—The patents are not ready for delivery by the Patent Office until some 14 days after the date of issue. NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

THOUGHTLESSNESS.—Persons sometimes return their paper, marked "stop this paper." Their name being pasted on the sheet they think that is all we need to be able to cross their names off. Now that is thoughtlessness. Your P. O. address is needed as much as your name. We have thousands of names arranged only according to locality. Our mailing clerk does not know where everybody lives.

BE MORE PARTICULAR.—We can only make the changes requested by the following parties on our mail list, when they, or some one else, send us their P. O. address. Otherwise we would have to look over from 1,000 to 10,000 names. Frank Becker, O. Seawell, L. Boyer, M. Levie, E. Anson and Antonis Byros. We also want the address of Wm. Buck.

UNKNOWN.—We have lately received cash at this office without due explanation, as follows: From Carson, Nev., \$4, by express.

The senders will please give full address, date of sending, etc.

CHOICE VOLUMES.—We have a full new set of Scribner's Monthly—ten volumes—well bound, for sale at this office. Price, \$2 per volume.

WOODWARD'S OARDBNS embraces an Aquarium, Museum, Art Gallery, Conservatories, Tropical Houses, Menageris, Seal Ponds and Skating Rink.

SEWING MACHINES.—We have a first-class machine which to dispose of on favorable terms. Apply at this office.

Persons interested in incorporated shares will do well to recommend the publication of this official notice of their companies in this paper, as this cheaply appropriates medium for the same.

Eureka Stone Manufacturing Company—

Location of principal place of business, city and county of San Francisco, State of California. Notice is hereby given that at a meeting of the Board of Directors held on the eighteenth day of March, 1876, an assessment, (No. 4) of ten cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, No. 557 Market street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the twenty-fourth day of April, 1876, will be delinquent, and advertised for sale at public auction, and unless payment is made before will be sold on the eighth day of May, 1876, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

P. D. MOWELL, Secretary.

Office, No. 557 Market street, San Francisco, Cal.

The Golden Sun Gold Mining Company.

Location of principal place of business, San Francisco, Cal. Location of works, Forks of Butte Mining District, Butte County, Cal.

NOTICE.—There are delinquent upon the following described stock, on account of assessment (No. 1), levied on the first day of March, 1876, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Robt R Walker.....	1002	20	5 00
Robt R Walker.....	1003	20	5 00
Robt R Walker.....	1004	20	5 00
Robt R Walker.....	1005	20	5 00
Robt R Walker.....	1006	20	5 00
Robt R Walker.....	1007	20	5 00
Robt R Walker.....	1008	20	5 00
Robt R Walker.....	1009	20	5 00
Robt R Walker.....	1010	20	5 00
Robt R Walker.....	1011	20	5 00
Robt R Walker.....	1012	20	5 00
Robt R Walker.....	1013	20	5 00
Robt R Walker.....	1014	20	5 00
Robt R Walker.....	1015	20	5 00
Robt R Walker.....	1016	20	5 00
Robt R Walker.....	1017	20	5 00
Robt R Walker.....	1018	20	5 00
Robt R Walker.....	1019	20	5 00
Robt R Walker.....	1020	20	5 00
Robt R Walker.....	1021	20	5 00
Robt R Walker.....	1022	20	5 00
Robt R Walker.....	1023	20	5 00
Robt R Walker.....	1024	20	5 00
Robt R Walker.....	1025	20	5 00
Benj F Josselyn.....	1026	50	12 50
Benj F Josselyn.....	1027	50	12 50
Benj F Josselyn.....	1028	50	12 50
Benj F Josselyn.....	1029	50	12 50
Benj F Josselyn.....	1030	50	12 50
Benj F Josselyn.....	1031	50	12 50
Benj F Josselyn.....	1032	50	12 50
Benj F Josselyn.....	1033	50	12 50
Benj F Josselyn.....	1034	50	12 50
Benj F Josselyn.....	1035	50	12 50
Benj F Josselyn.....	1036	50	12 50
Benj F Josselyn.....	1037	50	12 50
Benj F Josselyn.....	1038	50	12 50
Benj F Josselyn.....	1039	50	12 50
Benj F Josselyn.....	1040	50	12 50
Benj F Josselyn.....	1041	50	12 50
Benj F Josselyn.....	1042	50	12 50
Benj F Josselyn.....	1043	50	12 50
Benj F Josselyn.....	1044	50	12 50
Benj F Josselyn.....	1045	50	12 50
Benj F Josselyn.....	1046	50	12 50
Benj F Josselyn.....	1047	50	12 50
Benj F Josselyn.....	1048	50	12 50
Benj F Josselyn.....	1049	50	12 50
Benj F Josselyn.....	1050	50	12 50
Benj F Josselyn.....	1051	50	12 50
Benj F Josselyn.....	1052	50	12 50
Benj F Josselyn.....	1053	50	12 50
Benj F Josselyn.....	1054	50	12 50
Benj F Josselyn.....	1055	50	12 50
Benj F Josselyn.....	1056	50	12 50
Benj F Josselyn.....	1057	50	12 50
Benj F Josselyn.....	1058	50	12 50
Benj F Josselyn.....	1059	50	12 50
Benj F Josselyn.....	1060	50	12 50
Benj F Josselyn.....	1061	50	12 50
Benj F Josselyn.....	1062	50	12 50
Benj F Josselyn.....	1063	50	12 50
Benj F Josselyn.....	1064	50	12 50
Benj F Josselyn.....	1065	50	12 50
Benj F Josselyn.....	1066	50	12 50
Benj F Josselyn.....	1067	50	12 50
Benj F Josselyn.....	1068	50	12 50
Benj F Josselyn.....	1069	50	12 50
Benj F Josselyn.....	1070	50	12 50
Benj F Josselyn.....	1071	50	12 50
Benj F Josselyn.....	1072	50	12 50
Benj F Josselyn.....	1073	50	12 50
Benj F Josselyn.....	1074	50	12 50
Benj F Josselyn.....	1075	50	12 50
Benj F Josselyn.....	1076	50	12 50
Benj F Josselyn.....	1077	50	12 50
Benj F Josselyn.....	1078	50	12 50
Benj F Josselyn.....	1079	50	12 50
Benj F Josselyn.....	1080	50	12 50
Benj F Josselyn.....	1081	50	12 50
Benj F Josselyn.....	1082	50	12 50
Benj F Josselyn.....	1083	50	12 50
Benj F Josselyn.....	1084	50	12 50
Benj F Josselyn.....	1085	50	12 50
Benj F Josselyn.....	1086	50	12 50
Benj F Josselyn.....	1087	50	12 50
Benj F Josselyn.....	1088	50	12 50
Benj F Josselyn.....	1089	50	12 50
Benj F Josselyn.....	1090	50	12 50
Benj F Josselyn.....	1091	50	12 50
Benj F Josselyn.....	1092	50	12 50
Benj F Josselyn.....	1093	50	12 50
Benj F Josselyn.....	1094	50	12 50
Benj F Josselyn.....	1095	50	12 50
Benj F Josselyn.....	1096	50	12 50
Benj F Josselyn.....	1097	50	12 50
Benj F Josselyn.....	1098	50	12 50
Benj F Josselyn.....	1099	50	12 50
Benj F Josselyn.....	1100	50	12 50

Names.	No. Certificate.	No. Shares.	Amount.
S H Shepler, Trustee.....	1101	50	12 50
S H Shepler, Trustee.....	1102	50	12 50
S H Shepler, Trustee.....	1103	50	12 50
S H Shepler, Trustee.....	1104	50	12 50
S H Shepler, Trustee.....	1105	50	12 50
S H Shepler, Trustee.....	1106	50	12 50
S H Shepler, Trustee.....	1107	20	5 00
S H Shepler, Trustee.....	1108	20	5 00
S H Shepler, Trustee.....	1109	20	5 00
S H Shepler, Trustee.....	1110	20	5 00
S H Shepler, Trustee.....	1111	20	5 00
S H Shepler, Trustee.....	1112	20	5 00
S H Shepler, Trustee.....	1113	10	2 50
S H Shepler, Trustee.....	1114	10	2 50
S H Shepler, Trustee.....	1115	10	2 50
S H Shepler, Trustee.....	1116	10	2 50
S H Shepler, Trustee.....	1117	10	2 50
S H Shepler, Trustee.....	1118	10	2 50
S H Shepler, Trustee.....	1119	10	2 50
S H Shepler, Trustee.....	1120	5	1 25
S H Shepler, Trustee.....	1121	5	1 25
S H Shepler, Trustee.....	1122	5	1 25
S H Shepler, Trustee.....	1123	5	1 25
S H Shepler, Trustee.....	1124	5	1 25
S H Shepler, Trustee.....	1125	5	1 25
S H Shepler, Trustee.....	1126	5	1 25
S H Shepler, Trustee.....	1127	5	1 25
S H Shepler, Trustee.....	1128	5	1 25
S H Shepler, Trustee.....	1129	5	1 25
S H Shepler, Trustee.....	1130	5	1 25
S H Shepler, Trustee.....	1131	5	1 25
S H Shepler, Trustee.....	1132	5	1 25
S H Shepler, Trustee.....	1133	5	1 25
S H Shepler, Trustee.....	1134	5	1 25
S H Shepler, Trustee.....	1135	5	1 25
S H Shepler, Trustee.....	1136	5	1 25
S H Shepler, Trustee.....	1137	5	1 25
S H Shepler, Trustee.....	1138	5	1 25
S H Shepler, Trustee.....	1139	5	1 25
S H Shepler, Trustee.....	1140	5	1 25
S H Shepler, Trustee.....	1141	5	1 25
S H Shepler, Trustee.....	1142	5	1 25
S H Shepler, Trustee.....	1143	5	1 25
S H Shepler, Trustee.....	1144	5	1 25
S H Shepler, Trustee.....	1145	5	1 25
S H Shepler, Trustee.....	1146	5	1 25
S H Shepler, Trustee.....	1147	5	1 25
S H Shepler, Trustee.....	1148	5	1 25
S H Shepler, Trustee.....	1149	5	1 25
S H Shepler, Trustee.....	1150	5	1 25
S H Shepler, Trustee.....	1151	5	1 25
S H Shepler, Trustee.....	1152	5	1 25
S H Shepler, Trustee.....	1153	5	1 25
S H Shepler, Trustee.....	1154	5	1 25
S H Shepler, Trustee.....	1155	5	1 25
S H Shepler, Trustee.....	1156	5	1 25
S H Shepler, Trustee.....	1157	5	1 25
S H Shepler, Trustee.....	1158	5	1 25
S H Shepler, Trustee.....	1159	5	1 25
S H Shepler, Trustee.....	1160	5	1 25
S H Shepler, Trustee.....	1161	5	1 25
S H Shepler, Trustee.....	1162	5	1 25
S H Shepler, Trustee.....	1163	5	1 25
S H Shepler, Trustee.....	1164	5	1 25
S H Shepler, Trustee.....	1165	5	1 25
S H Shepler, Trustee.....	1166	5	1 25
S H Shepler, Trustee.....	1167	5	1 25
S H Shepler, Trustee.....	1168	5	1 25
S H Shepler, Trustee.....	1169	5	1 25
S H Shepler, Trustee.....	1170	5	1 25
S H Shepler, Trustee.....	1171	5	1 25
S H Shepler, Trustee.....	1172	5	1 25
S H Shepler, Trustee.....	1173	5	1 25
S H Shepler, Trustee.....	1174	5	1 25
S H Shepler, Trustee.....	1175	5	1 25
S H Shepler, Trustee.....	1176	5	1 25
S H Shepler, Trustee.....	1177	5	1 25
S H Shepler, Trustee.....	1178	5	1 25
S H Shepler, Trustee.....	1179	5	1 25
S H Shepler, Trustee.....	1180	5	1 25
S H Shepler, Trustee.....	1181	5	1 25
S H Shepler, Trustee.....	1182	5	1 25
S H Shepler, Trustee.....	1183	5	1 25
S H Shepler, Trustee.....	1184	5	1 25
S H Shepler, Trustee.....	1185	5	1 25
S H Shepler, Trustee.....	1186	5	1 25
S H Shepler, Trustee.....	1187	5	1 25
S H Shepler, Trustee.....	1188	5	1 25
S H Shepler, Trustee.....	1189	5	1 25
S H Shepler, Trustee.....	1190	5	1 25
S H Shepler, Trustee.....	1191	5	1 25
S H Shepler, Trustee.....	1192	5	1 25
S H Shepler, Trustee.....	1193	5	1 25
S H Shepler, Trustee.....	1194	5	1 25
S H Shepler, Trustee.....	1195	5	1 25
S H Shepler, Trustee.....	1196	5	1 25
S H Shepler, Trustee.....	1197	5	1 25
S H Shepler, Trustee.....	1198	5	1 25
S H Shepler, Trustee.....	1199	5	1 25
S H Shepler, Trustee.....	1200	5	1 25

Josephine Gravel Mining Company—

Location of principal place of business, San Francisco, California.

NOTICE.—There are delinquent upon the following described stock, on account of assessment (No. 1) levied on the twenty-third day of February, 1876, the several amounts set opposite the names of the respective shareholders, as follows:

WM. SMALL, Secretary.
Office, Room 2½, No. 635 California Street, San Francisco, Cal.

Spring Valley District.

The *Coso Mining News* says: This district is situated 25 miles east of Big Pine, in the northern portion of this county, on the east side of the Inyo range, the same range in which Cerro Gordo is situated. The district was some 13 or 14 years ago known as the White Mountain district. The name was changed in 1869 to that of Deep Spring Valley district. A large number of locations have been made since its formation, and a five-stamp mill was erected for working the ores in 1859, but the parties erecting and running the mill knew very little of the proper method of treating ores, and, of course, the mill was shut down. Indian troubles also were another cause of its suspension. From this time up to 1871-72, very little had been done in the district, either by millmen or prospectors, except by Messrs. Hiskey & Walker, who undertook to run the same mill, and these parties made it pay very well, considering the capacity of the mill. Most of the miners then engaged were Mexicans. Becoming involved in litigation with parties in San Francisco, and the Lida valley excitement springing up about this time, Messrs. Hiskey & Walker abandoned their mill at Deep Spring and went over to Lida. Since this time nothing has been done except by prospectors, and some considerable work having been performed on the Golden Treasure mine, by Mr. P. Harrington. This is on a gold-bearing vein of some eight to 12 feet in width, and cropping out holdly for a distance of 4,000 feet. The formation is in slate and porphyry, the slate being on the east and the porphyry on the west side of the vein. A shaft has been sunk to a depth of 80 feet and has been well timbered. At the point where the shaft is sunk the vein was about four feet on the surface, but at the bottom of the shaft it is shown to be eight feet. A number of tons of the ore were taken from this mine to Aurora, at the time that camp was in its glory, and by free milling process yielded \$45 per ton, but after assorting and roasting by the old cordwood process, it yielded at the rate of \$250 per ton in gold, with a small percentage of silver. The mine promises to turn out well indeed, and it is now in the hands of parties who intend to ascertain its value. We shall watch with much interest the development of this mine in particular, as, from actual observation, we believe good mines will yet be found in the northern portion of this country.

LEVI STRAUSS & CO.,

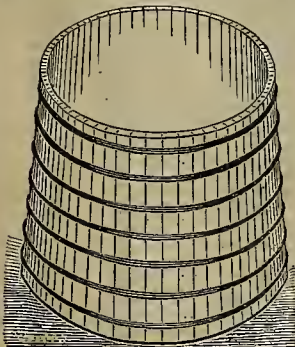
Patent Riveted

Clothing,

14 & 16 Battery St.,
San Francisco,

These goods are specially adapted for the use of FARMERS, MECHANICS, MINERS, and WORKING MEN in general. They are manufactured of the Best Material, and in a Superior Manner. A trial will convince everybody of this fact.

Patented May 12, 1873.
USE NO OTHER, AND INQUIRE FOR THESE GOODS ONLY. eow-bp



WATER TANKS of any capacity, made entirely by machinery. Material the best in use; construction not excelled. Attention, dispatch, satisfaction. Cost less than elsewhere.

WELLS, RUSSELL & CO.,
Mechanics' Mills, Cor. Mission & Fremont Streets
5v23-3m-ra

SAN FRANCISCO
Pioneer Screen Works,

Removed to 32 Fremont Street, near Market.

J. W. QUICK,



Manufacturer of perforated sheet metals of every description, at reduced rates. Mill owners using Battery Screens extensively, can contract for large supplies at favorable rates. This is the only establishment on the Coast devoted exclusively to the manufacture of Screens.

CHARCOAL
ANGELL'S DENTAL SOAP
for Whitening and Preserving the Teeth, J. W. ANGELL Prop., San Francisco.

Giant Powder.

Patented May 26, 1868.

THE ONLY SAFE BLASTING POWDER IN USE.

GIANT POWDER, NO. 1,

For hard and wet Rock, Iron, Copper, etc., and Submarine Blasting.

GIANT POWDER, NO. 2,

For medium and sandy Rock, Lime, Marble, Sulphur, Coal, Pipe Clay and Gravel Bank Blasting, Wood, etc.

Its EXCLUSIVE use saves from 30 to 60 per cent. in expenses, besides doing the work in half the time required for black powder.

The only Blasting Powder used in Europe and the Eastern States.

v22-3m16p

BANDMANN, NIELSEN & CO.,

General Agents, No. 210 Front Street.

Iron and Machine Works.

THOS. PENDERGAST.

HENRY S. SMITH.

ÆTNA IRON WORKS.

MANUFACTURERS OF

IRON CASTINGS

and MACHINERY,

OF ALL KINDS.

Fremont Street, bet. Howard and Folsom,

SAN FRANCISCO.

THE RISDON

Iron and Locomotive Works,

INCORPORATED.....APRIL 30, 1868.
CAPITAL.....\$1,000,000.

LOCATION OF WORKS:

Corner of Beale and Howard Streets,
SAN FRANCISCO.

Manufacturers of Steam Engines, Quartz and Flour Mill Machinery, Steam Boilers (Marine, Locomotive and Stationary), Marine Engines (High and Low Pressure). All kinds of light and heavy Castings at lowest prices. Cams and Tappets, with chilled faces, guaranteed 40 per cent. more durable than ordinary iron.

Directors:

Joseph Moore, Jesse Holladay, O. E. McLane,
Wm. Norris, Wm. H. Taylor, J. B. Haggis,
James D. Walker.

WM. H. TAYLOR.....President
JOSEPH MOORE.....Vice-President and Superintendent
LEWIS R. MEAD.....Secretary
24v17-qy

WM. HAWKINS.

T. G. CANTRELL

HAWKINS & CANTRELL,

MACHINE WORKS,

210 & 212 Beale St.,

Near Howard, - - - SAN FRANCISCO.

MANUFACTURERS OF

Steam Engines and all kinds of Mill
and Mining Machinery.

Also manufacture and keep constantly on hand a
supply of our

Improved Portable Hoisting Engines,

From Ten (10) to Forty (40) Horse Power.

N. B.—Johhng and Repairing done with Dispatch.

OCCIDENTAL FOUNDRY,

137 and 139 First street, - San Francisco.

STEIGER & KERR,

IRON FOUNDERS.

Quicksilver Condensers and Furnace Castings.

Sole manufacturers of the Hepburn Roller Pan
and Callahan Grate Bars, suitable for Burning
Screenings.

Notice.—Particular attention paid to making Superior
Shoes and Dies.

California Machine Works,

119 BEALE STREET, SAN FRANCISCO.

BIRCH, ARGALL & CO.,

Builders of QUARTZ, SAW AND FLOUR MILLS

Keating's Sack Printing Presses,

THE ECONOMY HYDRAULIC HOIST FOR STORES,
And General Machinists. 25v23-3m

McAFEE, SPIERS & CO.,

BOILER MAKERS
AND GENERAL MACHINISTS,

Howard st., between Fremont and Beale, San Francisco

Miners' Foundry and Machine Works,

OO-OPERATIVE,

First Street, bet. Howard and Folsom, San Francisco.

Machinery and Castings of all kinds.

Pacific Iron Works,

FIRST STREET,

SAN FRANCISCO.

Geo. W. Fogg, Supt.

MACHINERY AND CASTINGS

OF EVERY DESCRIPTION.

Heavy Forging Boilers, Stationary
and Marine.

JOBING AND REPAIRING WORK OF EVERY
KIND. SPECIAL ATTENTION GIVEN
TO MINING AND HOISTING
MACHINERY.

Sole Manufacturers and Agents of

PRALL'S PATENT STEAM PUMP.

GODDARD & CO., Props.

FULTON

Foundry and Iron Works.

HINCKLEY & CO.,

MANUFACTURERS OF

STEAM ENGINES,

Quartz, Flour and Saw Mills,
Hayes' Improved Steam Pump, Brodie's Im-
proved Crusher, Mining Pumps,
Amalgamators, and all
kinds of Machinery.

N. E. corner of Tehama and Fremont streets, above
Howard, San Francisco.

PACIFIC

Rolling Mill Company,

SAN FRANCISCO, CAL.

Established for the Manufacture of

RAILROAD AND OTHER IRON

Every Variety of Shafting,

Embracing ALL SIZES of

Steamboat Shafts, Cranks, Piston and Con-
necting Rods, Car and Locomotive
Axles and Frames,

- ALSO -

HAMMERED IRON

Of every description and size.

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COMPANY, P. O. box 2032, San Francisco, Cal., will re-
ceive prompt attention.
The highest price paid for Scrap Iron.

SHEET IRON PIPE.

THE

Risdon Iron and Locomotive Works

Corner Howard and Beale Streets,

Are prepared to make SHEET IRON AND ASPHALTUM
PIPE, of any size and for any pressure, and contract to
lay the same where wanted, guaranteeing a perfect
working pipe with the least amount of material.

Standard sizes of railroad Car Wheels, with special
patterns for Mining Cars. These small wheels are made
of the best Car Wheel Iron, properly chilled, and can be
fitted up with the improved axle and box—introduced by
this company, and guaranteed to outlast any other
wheels made in this State.

All kinds of Machinery made and repaired.

24v22-3m JOSEPH MOORE, Superintendent.

UNION IRON WORKS,

Sacramento.

ROOT, NEILSON & CO.,

MANUFACTURERS OF

STEAM ENGINES, BOILERS,

CROSS' PATENT BOILER FEEDER AND SEDIMENT

COLLECTOR

Dunbar's Patent Self-Adjusting Steam Piston

PACKING, for new and old Cylinders.

And all kinds of Mining Machinery.

Front Street, between N and O streets,

SACRAMENTO CITY.

The Phelps' Manufacturing Co.,

MANUFACTURERS

OF ALL KINDS OF CAR WORK,

Machine Bolts, Bridge Bolts and Ship or
Band Bolts,

13, 15 and 17 Drumm Street, San Francisco. 4v241y

Brass Foundry & Pump Factory.

A. J. SMITH, Plumber,

Sole Proprietor and Manufacturer of the

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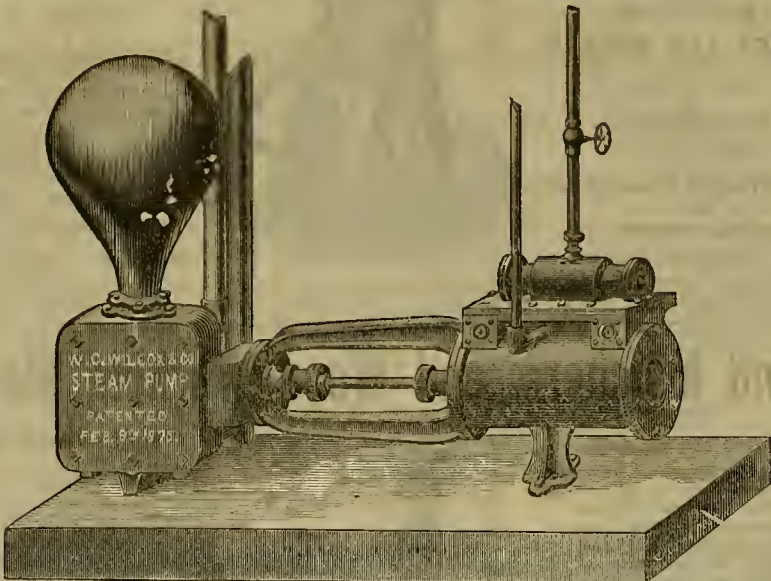
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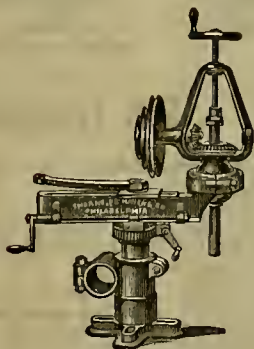
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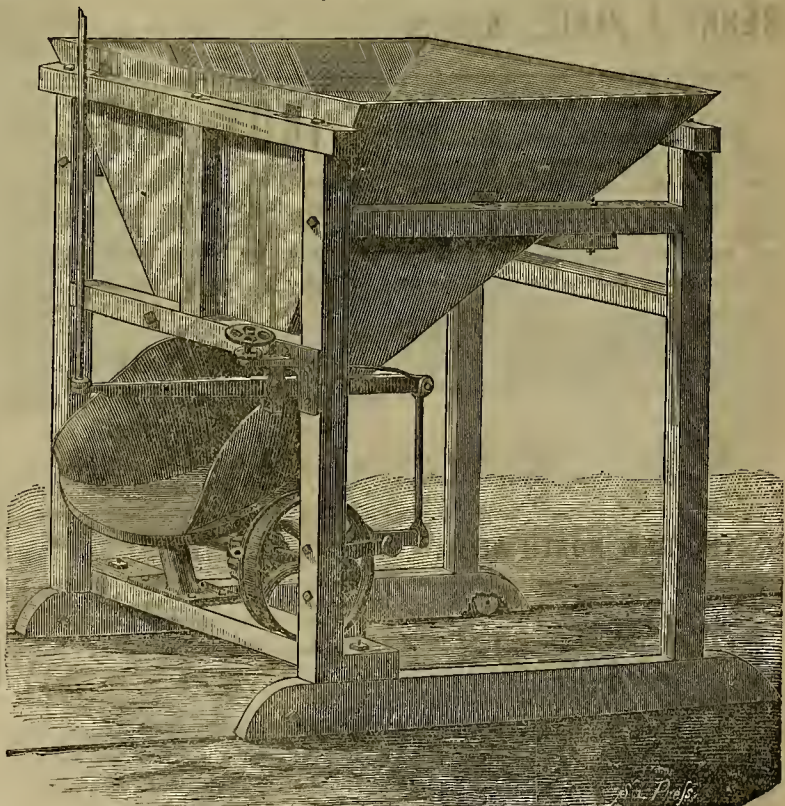
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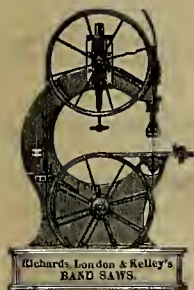


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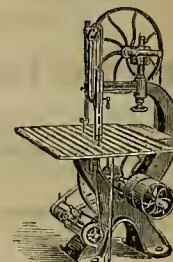
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Smith's Celebrated Molders.

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Consignments of Minerals Solicited for Centennial.

NOTICE.

All persons are notified not to purchase any interest in the Dry Washer for which J. J. Cruikshank filed a caveat on the twelfth day of February, 1876, as I am the inventor and have applied for a patent.

GEORGE GINN.

Belmont, Nevada, March 19th, 1876.

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SAN FRANCISCO, SATURDAY, APRIL 15, 1876.

VOLUME XXVII
Number 16.

The Pacific Coast and Other Mines Compared.

It was a singular coincidence that the discovery of extensive gold mines in California and Australia were so nearly coincident. During the last 25 years these two localities have contributed nearly equal amounts of gold to that leading specie basis of the world's commercial enterprise, but counting California and Nevada together, these two States have yielded considerably more than Australia. The country next in importance to the two mentioned is Russia, which derives its gold from two localities—the Ural mountains on the west of Siberia, and an extensive district in the southern central portion of the same territory. The average annual yield of the Ural mines is about \$2,500,000, while from other portions of Siberia not less than \$18,000,000 were annually derived during the seven or eight years subsequent to 1846. The island of Borneo is set down as yielding about \$5,000,000 annually. Japan in the height of the Dutch trade with that country is said to have exported about \$250,000,000 in 60 years. Its export has since greatly fallen off. Africa, though supposed to be one of the richest gold countries in the world, furnishes for export an annual average of only about \$7,000,000 or \$8,000,000. South America, with its mines in Chile, Peru, Brazil and Bolivia, was once one of the largest gold producing countries in the world; but of late years it has fallen among those of the least importance in this respect. Gold is found in almost every part of Europe, but in small quantities only. The Hertz mountains in Germany, among which the famous mining city of Freiberg is located, is one of the most important gold producing localities on that continent, and still these mines were over 300 years in yielding about \$60,000,000. The annual yield of the Southern States of our own country is only about \$1,000,000.

Until the development of the Comstock lode in Nevada, Mexico was the largest silver producing country on the globe. The *veta madre*, of all the Mexican lodes, probably approximates nearest to the Comstock in its yield of this metal. It also possesses many similar characteristics in regard to its formation, but it is more uniform in its yield, and in average richness is probably far inferior. The mines on that lode have been worked almost continuously for over 300 years, and yet its aggregate yield has not much, if any, exceeded \$300,000,000, while the Comstock has yielded more than half that amount during the last ten years.

The silver mines of Chihuahua are probably the richest in the world in bonanza, although no one has yet been discovered which has yielded such an immense aggregate as the actual and prospective present Comstock bonanza. The most remarkable bonanza body of ore yet worked in Mexico or in any other locality outside of the Comstock lode, was developed in the Chihuahua district of Mexico, the yield of

which has been estimated as high as \$50,000,000. It was 18 years in the process of extraction, by the slow, clumsy mode of Mexican mining; but might no doubt have been worked out in two years or less, under the energetic management and superior appliances now in vogue on the Comstock.

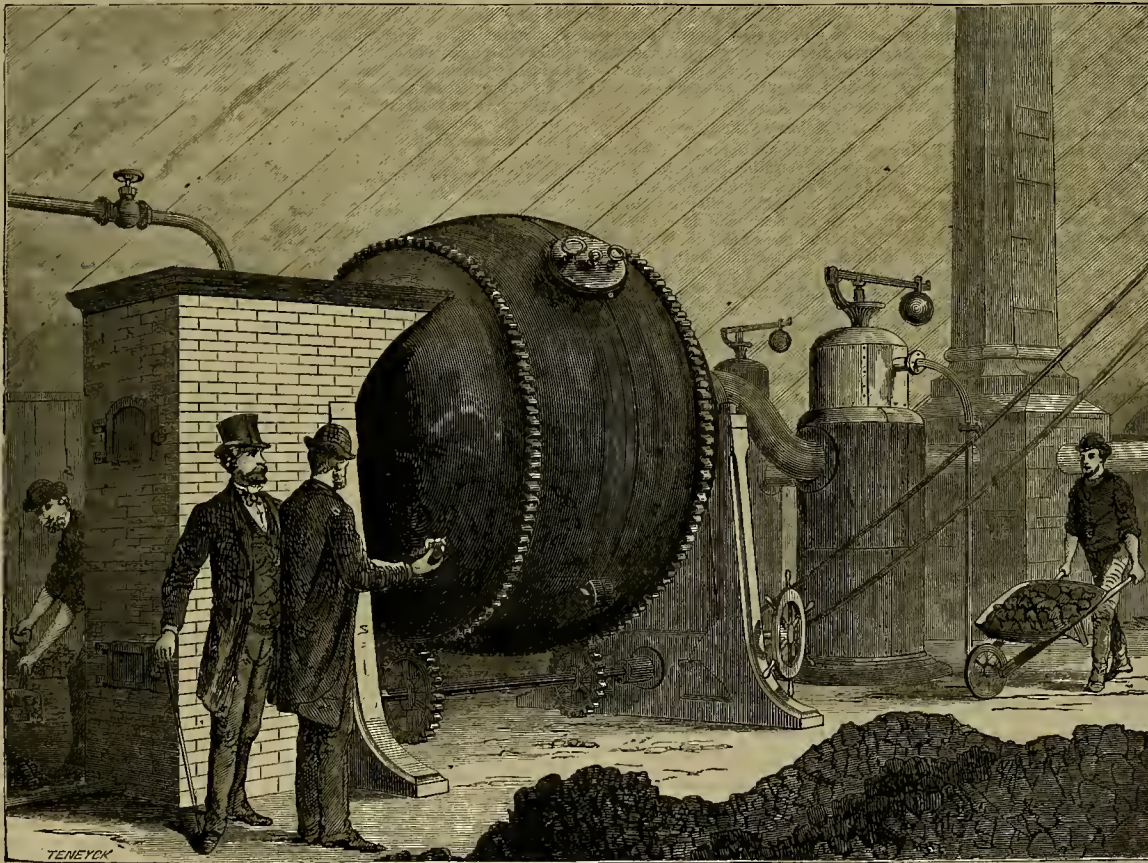
Some idea of the richness of the bonanza of Chihuahua may be formed from the fact that the first-class ore from these deposits yields all the way from fifteen to twenty thousand dollars per ton, while second-class is set down at a yield of from three to fifteen thousand dollars. The Comstock has nothing to equal this—the average of her present bonanza being two hundred—although there are large amounts of rich chlorides which might be selected that would reach thousands of dollars per ton value. The

half the precious metal deposits of the world; while they will be able to put in circulation and use nine-tenths of the annual increase of those metals. With such a prospect in view the mind is almost bewildered with the great future of wealth before us. The European balance of trade is now but slightly against us, and there can be no doubt that within a year or two the balance must be in our favor. When that time comes the accumulation of specie and other wealth in this country must be at a rate which will bear no comparison with anything in the previous history of nations.

Arizona Ores for the Centennial.

Arizona has made arrangements to secure a suitable representation of her mineral resources

Fig. 1.



MANES' NEW REVOLVING FURNACE FOR TREATING ORES, ETC.

Comstock has yielded more silver in the same space of time than any other known lode, and it is to-day, by far the richest mine in the world.

Immense as has been the yield of the Nevada mines, there is no reason to believe that we have, as yet, more than merely commenced their exploration. There is good reason to believe that many other mines will yet be developed in that State, if not of equal richness, at least closely approximating in value to the Comstock. Utah is also yearly improving in her yield of the precious metals; while New Mexico and Arizona are as yet scarcely prospected. All through an immense territory, embracing some 12 degrees of latitude by as many of longitude—outside of California—we have a region known to be most exceptionally rich in the precious metals.

Moreover, manifest destiny points inevitably to the early acquisition by the United States of the two northern provinces of Mexico—Sonora and Chihuahua—which cover the continuation of this rich mineral belt some four or five degrees still further south, and which are possibly still richer than the region already in the Union. With those provinces in our possession it is safe to say that the United States will hold

at the Centennial exposition at Philadelphia. The last legislature of that Territory made an appropriation of \$5,000 to carry out such an enterprise, but through some lack of attention on the part of those who should have taken the necessary steps to make the same available, the appropriation lapsed, and now through one of her enterprising citizens, Mr. Thomas Ewing, seconded by Gov. McCormick and the mine owners generally in Arizona, the exhibition will be made at private expense. The ores have already been shipped, so packed as to secure their arrival at Philadelphia in good condition. The exhibit will represent 22 different mines, and range in value all the way from one hundred to many thousands of dollars to the ton. According to the *Citizen* it would be impossible to convey by description any adequate idea of the beauty and richness of many of these specimens. This, we believe, will be the first general exhibition of Arizona ores ever made in any locality, and will no doubt prove of great advantage in bringing to the knowledge of the world some practical idea of the immensely valuable mineral resources of this distant mining region.

A New Revolving Furnace for Treating Ores, Etc.

Mr. Manes' Process of Handling Refractory Gold and Silver Ores.—First Process.

As a substitute for the various means now employed for removing sulphur, antimony, arsenic and other volatile substances from ores by roasting, and the smelting and reducing of the same in stationary furnaces, we illustrate in this issue an improved revolving furnace, invented by James Manes, of New Haven, Conn.

In this process the ore is first crushed or stamped to a powder and 25 per cent. of fuel and one per cent. of black flux mixed with it. When so treated the powdered ore, to the

amount of one ton or more, is put into the furnace (Fig. 2, which will be found on page 249) through the man-hole, J, which is then closed and the furnace started. The charge thus introduced will be thoroughly desulphurized in one hour or less, and the arsenic or other impurities carried off. The chemically prepared amalgam is next added, which takes up all the precious metals in a very short time. After this the charge may be removed to the settler or washing machine, where all the earthy matter is removed, and the amalgam left ready for retorting, when the work is completed.

For handling refractory and low grades of gold and silver ores, the inventor claims for the apparatus special advantages, as by its use several tons can be worked daily, and the labor of but one man to attend the furnace will be required. The globular form adopted is one easy of construction and well suited to sustain its great weight from two points of support. The lining of the interior can also be rendered more stable than in any other form, while it presents less surface for the radiation of heat.

Second Process.

If gold and silver ores must be smelted they are first desulphurized, the same as in the amalgamating process, and mixed with 20 per cent. of fuel (coke preferred) and one per cent. of red flux. The charge is then placed into the furnace (Fig. 3) through the man-hole, J. The furnace having been previously heated to a dull red color, with 500 pounds of lead at the bottom, it should be kept going at a very gentle blast until the whole is melted. The furnace is then tipped over with the lever wheel until the man-hole, J, is in a horizontal position. The cinder is then skimmed off, 100 pounds of zinc added and mixed thoroughly with the melted mass, and it will take up the gold and silver, which can then be skimmed off and retorted.

Fig. 1 is a perspective view of the apparatus; Fig. 2 a longitudinal section of the furnace as used for roasting ores; and Fig. 3 a transverse section of the invention arranged for smelting purposes. Referring to Fig. 2, A is a sphere of boiler plate or cast iron, lined with gaultier, fire brick, and asbestos, the effect of which lining is to keep the exterior of the sphere cool, even while an extremely high heat is maintained

(Continued on Page 249.)

CORRESPONDENCE.

Botanical Excursions.

[By J. G. LEMMON.]

No. 2.—The Northern Valley and Lassen's Peak. Part 1st. Sierra Valley to American Valley.

"I wish you would explore Lassen's peak again," writes Dr. Gray. "What I have seen from there but sharpens the appetite for more."

Some three years ago I visited Lassen's peak, on one of my first botanical trips. I was accompanied then, for the first time, by the genial gentleman who has so often been my companion since, Prof. E. L. Case. Starting from his then home, in Indian valley, we passed via Greenville, 70 miles, through Big Meadow valley, and, climbed old Lassen, spending 10 days in the exploration, and experiencing many interesting adventures—particularly that of sliding from the monument of Lassen down on the snow, over a half mile in less than a half minute.

We brought home a few plants only in a copy of *Harper's Monthly*, but among them were several new to California, one interesting *Cycladenia*, collected but once before, and a very beautiful, sweet-scented *Corydalis*, entirely new to science. It was perhaps the presence of these plants in the Harvard herbarium that caused Dr. Gray to make the above request.

I had agreed already to make a general collection of Sierra flora for Dr. Vasey, to exhibit at the Centennial, so to go again to Lassen's peak just suited me. Prof. Case being engaged in teaching, I solicited the company of Mr. John Larsen, a young dry-goods clerk, just then out of employ. Larsen was a new hand at mountaineering, but he soon learned to be very efficient in the care of the team and preparation of food, as also in collecting and preparing plants. A strong, and, we trust, life-long friendship is based upon that grand excursion.

We started from Sierra valley, June 18th, 1875, equipped with all the added articles that previous campaigning suggested, and certainly the passer-by could not mistake our business, or think we were going to suffer from hunger or cold on the trip. We knew it would be a grand excursion, for we were to pass through a long chain of the most delightful valleys in all California; and then at the far end of the east towered up Lassen's peak, ever snow-crowned, and commanding a view not only of northern California, but many miles over the border into Oregon.

With hearts elate we set out, and, with the editor's permission, the *RURAL* readers are again invited to accompany. But first let me give you a foretaste, a cursory glimpse of the country, lest you complain of the hardships endured before reaching the lovely scenes.

Prince Sierra and His Jewels.

The Sierra Nevada is a rich, lordly bejeweled prince among mountain ranges.

Reclining in state, like an Oriental monarch, upon the bosom of the great treeless plain of Western America, it is clothed from end to end—600 miles—and from base to base—140 miles—with a dense forest of evergreens, like a royal robe. This enrobing forest—the noblest in North America—is perforated along its center line by a thousand peaks, rising through the royal mantle into the Alpine region of eternal winter, and is rent along both slopes by a million valleys, depressed through the garment into the middle region of the changing seasons.

The peaks are the brilliant diamonds of this wealthy prince; the valleys, the hidden pearls. The former flash upon the voyager in the far Pacific and the Utah desert, but through the emerald setting of the forest must the explorer search for the latter resplendent gems.

Differing from a few acres to 400,000 acres in extent, these valleys floored with alluvial soil and carpeted with meadows, form the true wealth of the Sierra. To be sure the heart of the Sierra is golden, but where one mines into it and becomes a happy millionaire, a thousand dig as deep and become wretched mendicants. The gold first discovered led to the rapid up-building of camps and towns in the high ravines, now fast disappearing. The wealth of the valleys lately developed, is now attracting a population which will ever increase.

To work the mines, their debris must be spread over and ruin the valleys. The voice of fast growing communities is now loudly heard in rightful protest.

Prettiest of all these valleys, and also least affected by mining operations, are those found on the east side of the north end of the Sierra, which region may be taken for the broad breast of Prince Sierra, decorated with these bright jewels.

Five of the largest, arranged in nearly a right line, form center decorations or orders of nobility, surrounded by gems of lesser size and varied lustre, according as they are on the side toward the peaks or toward the plains.

These large valleys, while having a generic character of great fruitfulness, differ in attractions for the visitor, owing to the difference of latitude, origin, elevation, contour, area, population and surroundings. Let me bring these

valleys into one view for comparison of statistics—otherwise dull and valueless. The first on the south, 20 miles from the C. P. R. R., is Sierra valley, drained by the upper streams of the south fork of the Feather river. Latitude, 39½ degs. Elevation, 5,300 feet; contour, a Turkish crescent. Area, 300,000 acres. Population, 2,000. Towns, Sierraville, Randolph, Loyalton and Beckworth. Sentinel peaks, (or crowning diamonds—to continue this figure,) Webber, Haskell, Beckworth and Volcano.

The second, 16 miles northwest, is Mohawk valley, drained by the south fork of the Feather. Elevation, 4,500 feet; shape, a three linked Odd Fellow badge; area, 2,000 acres; population, 400; towns, Jamison and Eureka; peaks, Haskell and Eureka.

The third, 12 miles farther north, is American valley, drained by Spanish creek. Elevation, 3,200 feet; form, a Masonic triangle; area, 8,000 acres; population, 500; town, Quincy; peaks, Clermont, Spanish and Grizzly.

The fourth, 12 miles farther northwest, is Indian valley, drained by the middle fork of the Feather. Elevation, 9,300 feet; form, a four armed Melisse cross; area, 16,000 acres; population, 1,600; towns, Taylorsville, Crescent and Greenville; peaks, Kettle, Huff's and Greenville.

The fifth and last, 12 miles farther northward, is Big Meadow valley, drained by the north fork of the Feather. Latitude, 40½ degs.; elevation, 4,000 feet; contour, a heart shaped shield; area, 400,000 acres; population varying from a few families in winter to 500 souls in summer; town, Prattville; peaks, Keddie's, Black, and the over-towering-Lassen.

Sierra Valley.

In an article, "Sierra Valley and some of its New Flowers," published a year ago in the *RURAL*, I partially described this valley, so we will omit farther words now. While we scamper along the smooth roads northward, through the entire length of its crescent, the reader may look over its level of waving meadows and grain-fields, cross-barred with substantial board fences, and dotted with farm houses; he may gaze across at the heavy pine forest on the west and speculate upon the vast wealth of lumber in those tall, straight stemmed trees, or raise his eyes higher and contemplate the grandeur of the towering encircling peaks; then let him tell me if I exaggerate the beauties and wealth of Sierra valley.

Mohawk Valley.

Following down the south fork of the Feather river, rising in Sierra valley, we enter Mohawk valley on the east side of the middle link of the badge described, or middle valley of Mohawk. In the upper, on the east side is a celebrated sulphur spring, and one of the finest hotels in the mountains. Across the valley are the gravel mines and settlement of Mohawk. On the west side of the middle link, boring into the heart of Eureka peak, are the long tunnels of the Plumas Eureka quartz mine, the richest deposit of gold yet developed in the Sierra. Always paying increasing dividends, a few years ago it passed into the hands of an English company, the same that owns the Sierra Buttes mines and several others—who built mills, employed a large force of men, and now realize tenfold more profit annually. A new town, Eureka, grew up at the mouth of the tunnels, and a large and constant demand for the products of the valleys far and near. A tri-weekly freight and express plys between Eureka and Truckee, crossing Sierra valley, and a semi-weekly stage connects northward to Quincy and beyond.

On the east side of the lower link, or Teft's valley, are the Argentine quartz mines, employing several hands, who are abundantly supplied with food from the rich vegetable gardens of the valley.

Each of these little valleys and the open woods adjoining are studded with rare mountain flora, particularly the sweet Washington lily and the modest *Fritillaria recurva* and *pudica*. In Culver's orchard, in the settlement of Mohawk, by the upper valley, grows a new species—or at least a very remarkable variety—of violet, resembling in flower the *viola lobata*, but the stem is from 10 to 15 inches high and the leaves entire and cordate. In a cool spring and its brook near, grows the new *Corydalis Caseana*, of which, more hereafter.

American Valley.

This beautiful vale is one of the first settled on the eastern slope, owing to the gravel mines on the head waters of Spanish creek, still paying well, and it has been steadily appreciated as a home by a thriving people, who established the largest town and capital of Plumas—Quincy, in its comparatively small enclosure. Quincy has many fine residences and two large hotels necessary to accommodate the throng of summer visitors, that escape annually from the heats of the Sacramento valley.

Larsen and I were most hospitably entertained during our exploration of American valley and Clermont peak, by Mr. Sam Lee and wife, residing on a fine ranch south of Quincy. On this ranch grows the robust and lately discovered *Eriogonum ursum*, and near it the new *Solanum Zanli*.

Three and a half miles south of Quincy is a rich little valley called "Illinois ranch," owned by Mr. John Thompson, a successful farmer and experienced breeder of fine horses. His Plumas colts are beautiful and serviceable animals, always selling at high prices—some of them away up to a thousand dollars.

Mrs. Thompson is a great lover of flowers and takes the greatest pains and delight in their cultivation. Her gardens, walks, and

conservatories are, by far, the most extensive and finest of any in the mountains. She prizes equally well our native flowers, and has included a large number of them in her fostering care. Mrs. Thompson has a genial friend and co-worker in the person of Mrs. Dr. Cate, residing in Quincy. Among other achievements in the floral line, Mrs. Cate has produced a beautiful white leaved geranium, and has succeeded in bringing the famous *Darlingtonia* into bloom.

At the bare mention of that last plant, a long train of pleasant scenes and incidents comes trooping into mind, connected with Buttersfly valley, one of the attendant gems of American valley, and next to be described. But already this number is long enough for its kind, and we are only half way to Lassen's peak. Varied reading is what gives worth and popularity to a journal like the *RURAL*, so I must not crowd out other contributors, who may have much to say of more interest to the many.

(To be Continued.)

The New Fish Law.

The following is the full text of the act for the protection of the small fish in our waters from destruction by the Mongolian fishermen: An act to amend Section 634, 635 and 636 of the Penal Code.

The people of the State of California, represented in Senate and Assembly, do enact as follows:

Section 1. Section 634 of the Penal Code is hereby amended to read as follows:

Section 634. Every person who, between the first day of August and the first day of November in each year, takes or catches, buys, sells or has in his possession any fresh salmon is guilty of a misdemeanor. Any person catching or having in his possession, or offering for sale, shad at any time prior to the first Monday of December, A. D. 1877, is guilty of a misdemeanor. The following counties are exempted from the provisions of the first section of the bill: Del Norte, Humboldt, Shasta and Mendocino.

Sec. 2. Section 635 of the Penal Code is hereby amended to read as follows:

Section 635. Every person who places or allows to pass into any of the waters of this State any lime, gas, tar, coculus, indious, or any other substance deleterious to fish is guilty of a misdemeanor, and every person who uses any poisonous or explosive substance for the purpose of taking or destroying fish, is guilty of a misdemeanor; provided, that sawdust shall not be deemed a deleterious substance. Any person who shall catch, take or carry away any trout or other fish from any stream, pond or reservoir belonging to any person or corporation, without the consent of the owner thereof, which stream, pond or reservoir has been stocked with fish by hatching therein eggs or spawn, or by placing the same therein, is guilty of a misdemeanor.

Sec. 3. Section 636 of the Penal Code is hereby amended so as to read as follows: Sec. 636. Any person who shall set, use or continue, or who shall assist in setting, or using or continuing any pound, weir, set net, stake net, trap or any other fixed or permanent contrivance for catching fish in any of the waters of this State, is guilty of a misdemeanor; any person who shall hereafter close or keep closed, or in condition to catch or ensnare any shrimp, in any pound, weir, set net, stake net, trap or other fixed or permanent contrivance for catching the same, placed in the waters aforesaid, is guilty of a misdemeanor; any person who shall draw or shall assist in drawing any net or seine for the purpose of taking shrimps in any of the waters of this State, at any time between the setting of the sun on the evening of each Saturday and the rising of the sun on the morning of the succeeding Monday, is guilty of a misdemeanor; any person who shall draw or assist in drawing any net or seine for the purpose of taking fish in any of the waters of this State, the meshes of which are less than one and a half inches in size, is guilty of a misdemeanor; provided, that nets with a mesh of a smaller size may be used in the catching of shrimps; any person who shall cast, extend or set any seine or net of any kind for the catching of fish in any river, stream or slough of this State, which shall extend more than one-third across the width of said river, stream or slough at the time and place of such fishing, is guilty of a misdemeanor; any person who by seines or any other means shall catch any fish so small as to be able to escape through a mesh of one and one-half inches in size or the young of fish of any species, but which at the time of capture are too small to be marketable, and who shall not return the same to the water immediately and alive, or who shall sell or offer for sale any such fish, is guilty of a misdemeanor. One-third of all penalties received under this section shall be paid to the informer, one-third to the District Attorney of the county in which the case is prosecuted, and one-third to the school fund of said county; provided, that nothing in this section shall be construed to affect any special law now in force in this State for the preservation of fish; provided, that in the waters of Carquinez straits and Napa river set nets and stake nets may be set and used of meshes not less than two and one-half inches.

Sec. 4. This act shall take effect and be in force from and after its passage.

ANOTHER FARMER'S RAILWAY.—The farmers of Richland county, Wisconsin, have built a wooden railway, sixteen miles long, costing only three thousand dollars a mile.

Selby Hill Gravel Mining Company.

This company, says the Nevada Transcript, which is composed principally of San Francisco capitalists, a short time ago purchased this ground on Selby hill known as the Downis ground. This claim, as well as many others that adjoin it, has been lying idle for the past fifteen years or more, with the exception of this old Nebraska, now known as the Woodville. When these claims were in active operation there was quite a large settlement at Selby Flat and several hundred men were employed, and after this suspension of work this city felt its effect most severely. There were many causes for the cessation of work there; the principal ones, however, was want of fall to the known rich gravel lead which run through there, and several of the companies having lost the channel. It is estimated that millions of dollars have been taken out of the Nebraska and the adjoining claims at the time they were worked. As we said before, nothing has been done to this ground until now. The Selby Hill gravel mining company, whose ground adjoins the celebrated Nebraska, was incorporated a few weeks since and elected the usual officers, who immediately commenced work by letting a contract to Donnelly, Skehn & Co., to run a tunnel, which, when completed, the company will be able to work the ground to the lowest depths of the gravel. The tunnel is to be run 2,000 feet and will be 5 feet 10 inches in the clear, with timbers 8x8, making it of the most substantial character. They have run a cut about 100 feet to the face of the tunnel, which is on Austin ravine, near the residence of John Dunn, on Selby Flat, and have put in six sets of timbers, and have now encountered some hard blasting rock. Three shifts of men are at work on it night and day, and it is expected that it will take about nine months to complete the job, and by that time the whole claim will be in condition for very extensive work, and give employment to a very large number of men. While this work is going on, the superintendent, John Cashin, is contracting for 2,000 feet of iron pipe, which, when completed and put in, work of washing will be commenced, all of which will be ready in about three weeks. The tunnel is being run to work the heavy ground, while the surface will be worked through the creek. As soon as the pipe is connected with the South Yuba canal company's ditch, which will have a pressure of 280 feet, working will be commenced and carried on night and day, using about 1,000 inches of water per day and giving employment to many miners. A short time ago Mr. Cashin put two men to work on a small piece of this ground, in order to sample it. They worked a while with a small stream of water, in ordinary sluice boxes, and they cleaned up \$90. The ground they worked off could have been done with hydraulic power in an hour, which goes to show that the ground is exceedingly rich. The company have about 70 acres of gravel territory and it will take many years to work it out. The stock of the company has nearly all been taken and a sufficient number of shares for a working capital have been sold, and it is believed that the ground will pay sufficiently in a very short time to pay all the expenses the company have been at.

Mills and Mines About Mineral Park.

A correspondent of the Arizona Miner says: I have deferred writing up Mineral Park for some time, waiting until the Mineral Park mill should be completed and in full operation. The mill, thanks to the energy of R. B. Canfield, superintendent, and the skill of Madison Chase, the boss mechanic, under whose personal supervision the mill in all its parts has been constructed, is complete in all its parts, and is a perfect success. The only thing wanting is a first-class article of fire brick for the ends of the furnace cylinder, which it is believed will be obtained from material now on hand. The mill in all its parts is of the improved and perfect character, and no doubt superior to any other of like capacity on the Pacific coast. It is a 5-stamp mill of 550 pounds each, having 8-inch drop and 90 drops per minute, and crushes with No. 40 screen 10 tons per day. Engine, 10-inch cylinder and 20-inch stroke. The furnace is Bruckner's revolving cylinder with a capacity of 3,000 pounds at each charge; each charge requiring 6 hours. The machinery was built by H. J. Booth & Co., now Prescott, Scott & Co., of San Francisco, Cal. The steam pump—Hooker's No. 3—supplies the boiler and tanks connected with the amalgamating apparatus and the fire hose. The rock is prepared for the stamps by one of Blake's 8x10 rock breakers. A small burr-stone mill is used for crushing salt and sampling ore. The machinery was sent from San Francisco about one year since, but owing to the undeveloped state of the mines the work of construction was deferred until late last fall. It is intended for a general custom mill, for reducing the ores of the Wallapai mining district and surrounding country, and will no doubt exert a wonderful influence in assisting towards the development of hundreds of rich lodes in the country around. The total reducing capacity of the mill is fully equal to the capacity of the stamps. The ores crushed during the few days' work since starting have been from the Keystone mine, a half mile distant, and the Hackberry mine, being the south extension of the Hackberry mine, which is 30 miles east in the Pescoc mountains. The bullion product of the ores worked gives an average of \$200 per ton. The average chlorination of the furnace have exceeded 90 per cent.

SCIENTIFIC PROGRESS.

Evaporation and Percolation.

G. J. Symons, secretary of the British meteorological society, read a paper at the recent session of the Institute of Engineers, giving some very interesting experiments devised to measure the extent of atmospheric evaporation. His statement contained a proposal to gauge, by an apparatus as simple as an ordinary rain gauge, the loss of water from the re-evaporation of rain; the usual method of learning the hygrometric state of the air being by the dry and wet bulb thermometers. The gauge includes a percolation gauge, which was larger but did not differ greatly from the Dalton gauge, started by the late Mr. Dickenson at Abbott's Langley, to which the author had added one filled with fine sand to ascertain maximum percolation. Lastly, evaporation from the surface of water was determined by floating the gauge in a vessel or in some river, open tank or reservoir, and it was assumed that the water in the inner vessel acquired the general conditions of that in the outer vessel. The rain gauge and percolation gauges were not new, but the form employed for determining the amount of evaporation from the surface of water had not been proposed elsewhere; moreover, the four series of observations had never been brought forward in juxtaposition and with apparatus of uniform construction. Tables were submitted of the rainfall from observations uninterruptedly maintained since 1855; of the percolation, which by subtraction showed the evaporation from the ground, since 1855; of the percolation through sand, which furnished also the evaporation from sand, since 1860; and of the evaporation from a surface of water. The author gave the average rainfall as 25 inches, the average percolation through sand as 20 inches, and the evaporation from the surface of sand as five inches; percolation through earth as seven inches; evaporation from the surface of the earth as 18 inches; evaporation from the surface of open water, 20½ inches; and the gain of water in an open tank, four and one-half inches only. These tables showed that all the water that could be relied upon as retained for use was a depth of seven inches, if the rain fell upon a permeable soil, and of four and one-half inches if it fell on an open tank or reservoir. To secure more than this, covered reservoirs or close vessels to prevent evaporation would be necessary. The phenomena of peculiarly dry years—years in which rivers and springs have been deficient, viz., 1861, 1864, 1868, were discussed. Springs and rivers had been redundant in 1852-53, in 1857-58, in 1860, in 1866 and in 1872. It was manifest that with a view to provide for the permanent and continuous needs of large communities, the probable fluctuation of delivery of water in a river might be gathered by watching closely the sequence indicated by the percolation gauge. Heavy rains and storms in summer might produce a river flood, yet fail to replenish the springs; and a long frost, even with considerable snow, might leave rivers and springs very short of water for the following autumn; and a dry winter imperilled the permanence of river discharge more than a hot summer. The latter, however, might succeed a dry winter, under which circumstances the deficiency of water in the rivers must become alarming, in view of the present tendency to the agglomeration of populations. One result of the comparisons deduced from the tables attached to the paper was that the storage of water might be more safely and largely secured in a porous subsoil, covered with a turfed surface, than in ponds, reservoirs or other accumulations of open water. The author added that frequent thaws of small falls of snow produced the greatest amount of percolation; that hollow draining did not diminish the perennial flow of rivers; that capillarity had only a negative influence; that the influence of a wet period on percolation rarely extended over more than one season, and was soon obliterated by a dry winter succeeding. The flow of springs and of rivers followed the increase and decrease of percolation more closely than the rainfall, except in the temporary effects which immediately succeeded on copious rains. Negative evaporation, or an increment of water without rain, occasionally, though seldom, occurred in the floating gauge; but it was of frequent occurrence in the sand gauge, from the low temperature acquired by the sand by radiation, when the gauge became a dew tank.

RUSTING OF IRON.—It has generally been supposed that the rusting of iron depends principally upon moisture and oxygen. It would appear, however, from the late Dr. Calvert's experiments, that carbonic acid is the principal agent, and without this the other agencies have very little effect. Iron does not rust at all in dry oxygen, but little in moist oxygen, while it rusts very rapidly in a mixture of moist carbonic acid and oxygen. If a piece of bright iron be placed in water saturated with oxygen, it rusts very little; but if carbonic acid be present, oxidation goes on so fast that a dark precipitate is produced in a very short time. It is said that bright iron placed in a solution of caustic alkali does not rust at all. The inference to be derived is that, by the exclusion of moist carbonic acid from contact with iron, rust can be very rapidly prevented.

Detonation.

The last meeting of the British chemical society was held at Woolwich arsenal, and one of the subjects consisted of experiments on detonation. Of these there were three series. The first showed some of the conditions which promote detonation of an explosive agent by a blow or by the force exerted by an initial detonation. The experiment, however, intended to show that a fuse of mercuric fulminate, strongly confined and exploded in uncompressed gun-cotton, will not detonate it, directly contradicted the programme, and on repetition was equally unsuccessful. The second series illustrated the transmission of detonation, which as ascertained by Noble's chronoscope ranges from 18,000 to 21,000 feet per second. This has been determined by detonating a row of discs 36 feet long, insulated wires being stretched across the row at intervals of six feet; their rupture by the detonation gives spark records on the chronoscope, from the relative position of which the rate of transmission of detonation is calculated. These experiments were very successful. In the last of them 60 grammes of compressed gun-cotton were inserted into one extremity of a wrought iron tube five feet long, the detonation being transmitted to a disc of compressed gun-cotton inserted into the other extremity of the tube. The explosion split up the ends of the tube, breaking off one piece about six inches long, which whizzed through the air with a sharp sound, finally falling not very far from its original position. Various illustrations of the applications of detonation formed the third series. A wrought iron rail was destroyed by a charge of about half a pound of compressed gun-cotton placed upon it and detonated, illustrating the hasty demolition of a line of railway, by cavalry pioneers. A piece of wet gun-cotton, removed from a fire upon which it would not burn, was placed upon a block of granite and there detonated by a small charge of dry gun-cotton. Its effect was to shatter the granite to pieces. A stockade, built up of stakes about a foot thick, was similarly blown into small pieces, a great hole being also excavated in the earth. Finally a submerged charge of wet gun-cotton was detonated in a pool of water, sending a spout high into the air. In this case the charge was open on all sides to the water, being confined round the dry initiative charge only by means of a net.

Salicylic Acid.

Salicylic acid, until recently not found outside of chemical laboratories, is now coming largely into use as an antiseptic and as an agreeable substitute for carbolic acid. We give a variety of new recipes for its employment, taken from various sources: A very simple and most useful ointment, which answers admirably in some affections of the skin, is formed of one-half drachm to a drachm of the acid to seven drachms of simple ointment. A liniment of salicylic acid and olive oil (two drachms of the acid to eight ounces of oil) will be found of much efficacy in burns. Soak lint in the liniment and apply to the suppurating surface. Professor Will, of Aberdeen, who has tested this in some severe cases of burns, commends it strongly in the *Lancet*. For cancerous sores, Thiersch recommends dusting with pure acid, or with equal parts of the powder and starch; or powder formed of charcoal and the acid might be employed for the same purpose, or for dusting over poultices applied to sloughing surfaces. Another ointment is made of sperm oil, one and one-half drachms; oil of theobroma, two and one-half drachms; salicylic acid, from one-half to one drachm. This forms a thick paste, which should be thickly spread on lint. The heat of the surface acting on the oil of theobroma, a diffusible ointment is formed, which is a suitable application when it is desired to have the discharge thoroughly saturated with the antiseptic. An ointment less easily acted on by the body heat consists of sperm oil and paraffine, of each one and one-half drachms; oil of theobroma, two drachms; oil of almonds, one drachm; salicylic acid, from one-half to one drachm.

PHOSPHIDE OF COPPER.—What has been introduced with some éclat as an alloy of copper and phosphorus proves not to be an alloy, but a true chemical combination of copper with phosphorus, or a phosphide of copper in definite proportions. The union of the two may be through the hot or cold process, the cold sufficing for certain applications, being preferable indeed to combinations produced by heat. By the hot process the introduction of simple bodies other than the metals or metalloids is prevented. The copper used in the process must be commercially pure. Of the three kinds of phosphorus the operator may take his choice; the ordinary, the amorphous, and the earthy bi-phosphates. The amorphous is the most expensive, and is also the best. According to Delatol, the percentage of phosphorus varies from two to four, between which there may be an infinity of degrees, although for industrial purposes five varieties meet all the requirements. These are formed with two per cent. of phosphorus, two and a half per cent., three, three and a half and four per cent. Above four phosphor bronze is useless, but between three and four per cent. the material is claimed to be superior to any other metal or alloy.

FARADAY calculated that the decomposition of a single grain of water required 800,000 discharges of his Leyden battery.

MECHANICAL PROGRESS.

Dynamite.

The wide use of dynamite as an explosive renders valuable all careful tests of its qualities and characteristics. The latest issue of *Iron* contains an account of some tests with the explosive, recently made by the British dynamite company, bearing directly on the safe transport of dynamite by rail. In the first test, a 3 cwt. block of iron, being raised to a height of 24 feet, was allowed to fall on a wooden box containing 50 pounds of dynamite. As the result, the box was smashed, and although several of the cartridges were compressed and burst, no explosion ensued. With a view of showing the intense local action of the explosive, 10 pound weight was placed at a distance of nine feet from a temporary wooden fence, and after the explosion it was found that fully one-half of the spar had escaped damage, whereas it was concluded that had an equal quantity of gunpowder been fired the paling would have been entirely destroyed. Though dynamite was knocked about during a collision, the manager expressed his belief that it would not explode, and even should this be the case the area of destruction would be extremely small. In order to prove the effective use of dynamite as a fog signal at sea, experiments of a different kind were made. It could be fired from a spar without the slightest danger either to the spar or to those on deck—as was shown by two cartridges being placed at the end of a fishing-rod, which remained intact—or the same effect would follow if the cartridge were attached to a small piece of wood and thrown into the water. In another experiment a cartridge was sent to the bottom of a pond, the explosion sending up the spray in a column 40 feet in height. With a view to test the effect of an explosion of gunpowder on a box of dynamite, 25 pounds of powder was placed in a hollow, closely covered by a large half-inch iron plate, on the top of which was laid a box containing 10 pounds of dynamite. After the firing of the charge it was found that the plate had been thrown a distance of nine feet, and had smashed the box, without any explosion of dynamite having taken place. Afterwards a wire rope, fully one inch in diameter, was nearly severed by half a pound of the explosive, and this was considered an operation difficult of performance. The final experiment consisted of forcing a circular tin plate through a half-inch iron plate. To effect this two pounds of dynamite was placed in a small wooden roller, open at either end, a tin plate, the exact circumference of the opening, being placed at one end, and the iron plate at a distance of two feet. By the explosion the tin plate was completely smashed, but it had perforated the iron plate, leaving a series of neat circular openings. It was explained that the roller being open at either end the explosive force was diminished by one-half, and that by placing a plate at each end the test could be duplicated. Although numerous other experiments were in preparation, the gentlemen present expressed themselves satisfied with what they had seen.

The Preparation of Dynamite.

Of the composition of the substance tested above we find the following in the *American Chemist*: Of the numerous explosive powders put on the market, dynamite alone appears now to be in demand. Dynamite, containing 75 per cent. of nitro-glycerine, should theoretically have three-fourths the explosive force of that agent. Practically its power is about two-thirds that of nitro-glycerine, probably in consequence of the absorption of heat by the silica. Five hundred kilos of dynamite are used daily in the St. Gothard tunnel. If the rock is very wet, a German preparation called "cellulose dynamite" is used, which does not part mechanically with its nitro-glycerine so readily as the silica. Its mode of preparation is not known. Three classes of absorbents are used for nitro-glycerine. 1, Natural silicious material; 2, Artificially prepared silica; and 3, Some spongy material, to which class the cellulose belongs. Dynamite No. 1 contains 75 per cent. nitro-glycerine; dynamite No. 2 contains a sodic or potassic nitrate powder, with about 40 to 50 per cent. nitro-glycerine; dynamite No. 3 contains still less nitro-glycerine and more of some cheap gunpowder. All three are about equal as regards explosive force. According to Nobel, the best No. 2 contains an ammonia powder and 15 to 20 per cent. of nitro-glycerine, and gives 10 per cent. more explosive power than No. 1 dynamite. In using dynamite, one-third less holes and holes one-fourth less in size than with gunpowder are necessary. The saving from its use is about 30 per cent. No. 1 burns more readily than Nos. 2 or 3.

A NEW ANTI-INCORUSTATOR.—A new anti-incrustator has lately been introduced under the name of apparaline, which is prepared by stirring up 16 parts of potato starch in 76 parts of water, and then adding eight parts of potash or soda lye, at 25 deg. Baume, the whole to be thoroughly mixed together. In a short time the mixture forms a thick jelly, and it is then beaten up vigorously for a time, when it forms a colorless, transparent substance, slightly alkaline to the taste, and of a strong glue-like consistency. It dries slowly in the air, without decomposition, and when perfectly dry resembles horn, but is more flexible. When introduced in small quantity into steam boilers it prevents their incrustation. It is also

capable of nearly all the applications of ordinary gelatine, and is especially adapted for alizing textile goods of all kinds, imparting to them a hitherto unattained smoothness. When once applied to goods and dried it is perfectly insoluble, as three or four washings in hot water have proved to have no effect upon it. It can also be used as a thickening in calico printing. Several of the textile journals speak of this substance as a very important addition to the resources of the manufacturer and dyer. Care must be taken to retain it in air-tight vessels until it is used, as it is not easily rendered soluble again when it once becomes hard.

A Suggestion for the Centennial.

Our London exchange, *Iron*, makes the following suggestion for mechanical progress at the Centennial. It says: The question of the best form for the interior of the blast furnace has not of late years occupied so prominent a place in metallurgical discussions as it deserves. Advantage might be taken of the forthcoming Exhibition at Philadelphia to secure much valuable information, which it would be beyond the power of any individual, or even an association, to obtain at any other time, but which, once collected, would be of the greatest service to metallurgical industry. It is not, even now, too late for the commissioners of England, Germany, France and Austria, in conjunction with the American Centennial authorities, to invite by circular the leading metallurgical firms of their respective countries to furnish, in a specified form, such detailed particulars, illustrated as far as possible by plans, of the working of the plant and processes under their control, as they may feel disposed to give. Such information from reliable sources would at once set at rest many vexed questions, which would otherwise only be tardily solved at an enormous cost of unproductive labor and wasted material. That we ourselves have much to learn from the best Continental and American practice, is not less true than that in many points we are in advance of our neighbors. Not the least important feature in such a programme would be the collection of a series of internal sections of blast furnaces blown out for repairs or other causes (of which there are unfortunately just now only too many). Accompanying these fire-shaped sections would be drawings of the original contour, with full details of the charges used, and the working immediately before the stoppage, and at different periods of the campaign. Such returns would form a solid basis for subsequent progress, and would materially advance that which should be the leading object of a true world show—the growth of technical knowledge. Failing its adoption by official representatives, we commend the idea to such bodies as the various societies of engineers, the American Institute of mining engineers, and our own iron and steel institute.

The Wisconsin Reward.

Considerable interest has been awakened in mechanical circles by the announcement that the Wisconsin Legislature had offered \$10,000 reward for a steam road wagon for agricultural purposes. In answer to many queries, G. M. Marshall, a member of Assembly, has written to the *Scientific American* as follows: "To fill the bill, the machine must travel 200 miles north and south over very poor roads that are often sunk or worn down—in the wheel and horse tracks—six inches to a foot below the common level, but with a ridge in the center, the ridges being impassable for a horse; more so for the wheel of a steamer when we take into account the bumps and stones, avoided by a double team and left in the center ridge. Our wagon track is about four feet six inches outside, and that must be the gauge of a steamer, which machine should not weigh more than two tons and must be so arranged that it will climb steep and hills, cross poor bridges, run easily over bogs, stumps and grubs, and out of ruts, etc., just as a loaded lumber wagon does; and it must travel at the average rate of five miles per hour, and, in the language of the law, 'be a cheap substitute for horses and other animals on the highway and farm.'"

The Wisconsin farmers evidently desire to get the worth of their money. It is a wonder they did not add that in case of flood the wagon should be able to climb a tree to keep out of the wet. By the terms of the law, competition for the reward is only open to Wisconsin-citizens.

A Cold Twisted Rail.

In the blacksmith shop of the Cambria iron works, several employees, under the direction of Mr. D. N. Jones, mechanical engineer of that incorporation, have just concluded twisting one of the steel rails manufactured at the industry, by way of experimenting upon it. One end was fastened permanently, and at the other a casting similar to an ordinary capstan head was fitted on. By means of levers the twisting was done gradually, the rail being cold, and the operatives gave it nearly nine turns before getting through. The rail was so uniform in quality as to leave it almost impossible for the eye to detect the least irregularity in the entire length, and there was not the sign of a flaw in any portion of it. As an indication of the excellence of manufacture of the steel rails turned out by the Cambria works this test is a most satisfactory one, and a great many persons have been led by curiosity to see the one which was experimented upon.—*Johnstown (Pa.) Tribune*.

California Stock Board.

WEDNESDAY, A. M., APR. 12.	29 Ward.....26 1/2
20 Alpha.....b 10.49	90 Yellow Jacket.....37 1/2
100 Andes.....h 10.49	100 do.....h 3.37 1/2
100 Amazon.....12 1/2	
50 Baltimore.....24 1/2	
200 Cosmopolitan.....13 1/2	
120 Brooks.....h 3.34	
10 Best & Belcher.....59 1/2	
20 Belcher.....33	
200 Consolidated.....h 13 1/2	
35 Caladenia.....13 1/2	
35 Con Virginia.....54 1/2	
20 City of Boston.....50 1/2	
10 Chollar.....h 3.15	
40 California.....50 1/2	
450 Coso Con.....56 1/2	
35 Crown Point.....26 1/2	
10 Da ton.....h 5.75	
100 Europa.....62 1/2	
500 Erie Con.....1.05	
100 do.....do.....1.05	
20 Gila.....do.....2	
20 Gould & Curry.....h 3.21 1/2	
10 Gould & Curry.....21	
164 Gold & Silver.....12 1/2	
40 Julia.....15	
10 Jusico.....h 3.31	
125 Ketchikan.....12 1/2	
100 Leviathan.....12 1/2	
200 Mint.....b 5.50	
100 Monumetal.....75c	
100 Montana.....26 1/2	
60 Mexican.....33 1/2	
20 Mexican.....h 3.40 1/2	
30 Martha Beesie.....36	
100 North Carson.....50 1/2	
500 Niagara.....27 1/2	
175 N C Virginia.....12	
100 Ohio.....do.....12	
100 Phil Sheridan.....15 1/2	
100 Prospect.....h 5.5	
500 do.....h 5.5	
450 Port of San Francisco.....12 1/2	
100 Rock Island.....31 1/2	
50 Rye Patch.....50c	
500 do.....25c	
500 Suro.....25c	
20 Senator.....150	
40 Sierra Nevada.....25	
60 do.....16 1/2	
150 Trojan.....16 1/2	
420 Union.....19 1/2	
20 do.....h 5.19 1/2	
300 Union.....19 1/2	
20 Wm Penn.....12 1/2	
75 Woodville.....24 1/2	

15 Andes.....39 1/2	
50 Alabama.....h 30.15	
100 Amazon.....do.....5 1/2	
200 do.....do.....12 1/2	
10 Belmont.....12 1/2	
10 Best & Bel.....5 1/2	
10 Belcher.....32 1/2	
200 do.....h 3.34	
20 California.....59 1/2	
150 Coso Con.....50	
10 Caladenia.....5.13 1/2	
200 do.....h 3.34	
200 Europa.....62 1/2	
30 do.....h 3.75	
30 Fontana.....do.....13 1/2	
200 Garrison.....10.37 1/2	
10 Gould & Curry.....h 5.20 1/2	
10 Imperial.....do.....12 1/2	
10 International.....b 10.12 1/2	
200 do.....do.....20 1/2	
100 Jefferson.....26 1/2	
40 do.....b 5.5	
200 Julia.....do.....12 1/2	
300 Ketchikan.....17 1/2	
200 Kentuck.....17 1/2	
500 Kist Utah.....37 1/2	
350 Leviathan.....12 1/2	
10 Leopard.....do.....12 1/2	
200 Monumetal.....75c	
500 N Carson.....h 3.13	
25 N Con Virginia.....b 30.15	
100 N Carson.....do.....50	
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MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in the Mining and Scientific Press and other S. F. Journals.]

ASSESSMENTS.—STOCKS ON THE LIST OF THE BOARDS.

Company.	Location.	No. Amt. Levied.	Delinq't. Sale.	Secretary.	Place of Business.		
Amazon Cons M Co	Nov	2	25 Feb 24	Mar 24	April 17	R P Hosmer	330 Pina at
Baltimore Co M Co	Washoe	11	1 00 Mar 24	May 1	May 20	O A Sankey	331 Montgomery at
Belmont Co M Co	Nyo Co Nev	8	50 Mar 24	May 1	May 20	Crank Swift	419 California at
Clons Co M Co	Cal	1	30 Mar 25	April 13	May 1	R H Brown	402 Montgomery at
Crown Point M Co	Washoe	25	1 00 Apr 5	May 10	May 31	O E Elliot	419 California at
Ki Dorado South Con M Co	Nov	9	2 00 Mar 23	Apr 27	May 17	W E Dean	309 Montgomery at
Empire M & M Co	Washoe	21	1 00 Mar 2	Apr 5	Apr 25	W E Dean	309 Montgomery at
Ennska Oons M Co	Nov	1	1 00 Mar 1	April 5	April 25	W W Traylor	302 Montgomery at
Ganera Co M Co	Nov	2	20 Mar 4	Apr 10	May 1	J T Milliken	302 Montgomery at
Glasgow G & S M Co	Nov	2	25 Feb 21	Mar 24	April 17	R P Hosmer	330 Pina at
Golden Charlot M Co	Idaho	16	50 Feb 19	Mar 24	April 19	L Kaplan	419 California at
Gold & Curry S M Co	Washoe	25	1 00 Mar 22	Apr 26	May 16	A K Durbow	309 Montgomery at
Great Eastern Con Q M Co	Cal	3	10 Apr 11	May 12	May 30	J G Riley	331 Montgomery at
Huhn & Hunt S M Co	Ely Dist	12	41 Mar 9	Apr 17	May 12	H O Olmstead	409 California at
Knickerbocker M Co	Washoe	15	1 00 Jan 21	Mar 1	Apr 19	D L Thomas	419 California at
Lady Bryan M Co	Nov	11	1 00 Mar 27	Apr 27	May 14	W H McCintock	419 California at
Leopard M Co	Elko Co Nev	1	1 00 Mar 31	May 3	May 22	R H Brown	402 Montgomery at
New York M Co	Washoe	9	20 Mar 23	May 1	May 19	D L Thomas	419 California at
New York Con M Co	Washoe	18	50 Mar 23	May 1	May 19	D L Thomas	419 California at
North Cons Virginia M Co	Washoe	2	25 Mar 9	Apr 13	May 14	J Maguire	419 California at
Prussian G & S M Co	Nov	7	1 00 Mar 10	Apr 12	May 11	R H Brown	402 Montgomery at
Wyoming G & S M Co	Cal	1	1 00 Feb 8	Apr 3	Apr 24	R H Brown	311 California at
Pauper M Co	Idaho	7	20 Feb 26	Mar 2	Apr 24	E V Grant	324 Montgomery at
Pioche S M Co	Ely Dist	12	10 Feb 25	Apr 8	May 2	C E Elliot	419 California at
Savage M Co	Washoe	23	2 00 Apr 4	May 8	May 27	R B Holmes	309 California at
Seg Hebl S M Co	Washoe	15	50 Apr 11	May 16	June 6	M F Ward	414 California at
Sierra Nevada S M Co	Washoe	13	50 Feb 23	Apr 8	Apr 21	J H Sayre	330 Pina at
Sierra Nevada S M Co	Washoe	43	1 00 Feb 23	Mar 28	Apr 18	W W Stetson	309 Montgomery at
South Charlot M Co	Idaho	16	25 Mar 3	Apr 5	Apr 24	F Swift	419 California at
South Overland Cons M Co	Washoe	25	1 00 Mar 3	Apr 8	Apr 24	D W Bunting	309 California at
Union Cons S M Co	Washoe	9	1 00 Mar 3	Apr 8	Apr 24	J M Humphins	309 California at
Yellow Jacket S M Co	Washoe	22	1 00 Mar 18	Apr 21	May 24	O W Hopkins	Gold Hill

OTHER COMPANIES.—NOT ON THE LISTS OF THE BOARDS.

Alameda Coal M Co	Cal	1	10 Mar 17	Apr 20	May 13	F Dodge	409 Battery at
Alameda S M Co	Utah	1	12 Mar 17	Apr 20	May 13	W R Townsend	330 Pina at
California Watch Co	Alameda Co Cal	1	5 00 Mar 8	Apr 8	May 15	H T Graves	120 Sutter at
Con Reform M Co	Lower Cal	3	50 Mar 24	Apr 26	May 15	A D Carpenter	318 California at
Coronacion Co M Co	Nov	1	10 Mar 14	Apr 17	May 8	F Swift	419 California at
East Yellow Jacket M Co	Pimas Co Cal	1	5 Mar 13	Apr 17	May 10	P T Turner	621 Sansome at
Enterprise Co M Co	Washoe	1	10 Mar 20	Apr 29	May 23	P T Turner	419 California at
Frederick Quicksilver M Co	Cal	7	15 Mar 29	Apr 7	Apr 21	J P Hermann	414 California at
Golden Sun Co M Co	Batte Co Cal	1	25 Mar 1	Apr 21	Apr 21	J P Hermann	702 Market at
Green Valley Blue Gravel Co	Cal	5	25 Mar 29	May 3	May 26	A D Carpenter	605 Clay at
Iris M Co	Utah	3	30 Feb 15	Mar 21	Apr 18	P Madgo	409 California at
Joe States Co M Co	Washoe	12	50 Mar 21	Apr 9	Apr 26	W R Small	324 Montgomery at
Josaphine Gravel M Co	Cal	1	10 Feb 23	Mar 25	Apr 10	A Halsey	531 California at
Kennedy M Co	Cal	12	1 00 Mar 28	May 2	May 22	A Wissel	210 California at
Klamath Quartz M Co	Cal	3	3 00 Mar 2	Apr 10	May 2	J F Nesmith	315 California at
London Quick M Co	Cal	50	50 Mar 2	Apr 10	May 2	J F Nesmith	507 Montgomery at
London Quicksilver M Co	Napa Co Cal	4	4 Feb 23	Mar 23	Apr 24	A Halsey	206 Sansome at
Mennon M Co	Nov	1	5 Mar 15	Apr 18	May 8	W E Dean	419 California at
Mount Savage M Co	Utah	3	10 Feb 24	Mar 31	Apr 20	D F Verdonal	409 California at
North Bloomfield G M Co	Cal	12	10 Mar 29	May 1	May 15	M F Ward	320 Sansome at
North Chilian M Co	Washoe	1	10 Mar 3	Apr 6	Apr 28	J Maguire	419 California at
North Dayton G & S M Co	Nov	1	5 Mar 14	Apr 19	May 6	R S Culverwell	320 Sansome at
Oceanic Co M Co	Cal	3	50 Mar 16	Apr 18	May 5	G W Funk	438 California at
Olympia R & M Co	Oregon	1	1 00 Feb 15	Mar 23	Apr 9	W Wille	Nevada block
Quadrille Co M & M Co	Cal	1	5 Feb 24	Apr 4	Apr 22	W F Bostart	323 Montgomery at
Renton Coal M Co	Washington Ter	1	1 00 Mar 2	Apr 15	May 10	T H Henderson	21 Sacramento at
Ran Jose M Co	Nov	12	5 00 Mar 18	May 15	July 10	A Carrigan	329 Montgomery at
Silver Spring M Co	Cal	1	10 Mar 28	May 6	May 31	O H Bogart	324 Montgomery at
Stoek Broker M Co	Washoe	1	5 Feb 29	Apr 3	Apr 20	J Tson	236 Montgomery at
Superior G & S M Co	Cal	10	10 Mar 4	Apr 30	May 15	L Leavitt	309 Montgomery at
Tahoe Mt Alpine Co	Cal	3	50 Mar 14	Apr 17	May 8	D K Tripp	401 California at
Wall Street G & S M Co	Cal	1	10 Feb 23	Mar 31	Apr 24	L Kaplan	Merchants' Ex
White Mountain M Co	Amador Co Cal	1	5 Mar 25	May 1	May 22	S K Nichols	215 Sansome at

MEETINGS TO BE HELD.

Name of Co.	Location.	Secretary.	Office in S. F.	Meeting.	Date.
Benton Co	Cal	Wm H Watson	302 Montgomery at	Special	Apr 26
Boyer M Co	Cal	Wm H Watson	302 Montgomery at	Special	Apr 26
Cooper G & S M Co	Cal	P G Wood	418 Montgomery at	Special	Apr 26
Empire Q M Co	Cal	F Parrott	405 Front at	Special	Apr 26
Hartford M Co	Washoe	Caldwell Trustees	419 California at	Annual	May 1
Independent Omega M Co	Washoe	Jos Maguire	419 California at	Annual	Apr 28
Indian Queen M & M Co	Nev	A K Durbow	Nevada Block	Annual	Apr 25
Jenny Givon M Co	Cal	Oakley Trustees	408 California at	Special	Apr 17
Justice M Co	Washoe	J S Kennedy	419 California at	Special	May 1
Roseth M Co	Washoe	T F Stone	419 California at	Special	May 3
Mitchell G & S M Co	Washoe	A O Hammond	507 Montgomery at	Annual	Apr 29
New Idria M Co	Cal	E Mielcke	Bank of California	Annual	Apr 24
North M Co	Nev	Frank Swift	415 California at	Annual	Apr 18
Shasta Coal M Co	Cal	H H Haight Pres't	334 Pina at	Annual	Apr 18
Wyoming M Co	Cal	J M Buntington	311 California at	Annual	Apr 17

LATEST DIVIDENDS (within three months)—MINING INCORPORATIONS.

Name of Co.	Location.	Secretary.	Office in S. F.	Amount.	Payable.
Alta S M Co	Washoe	Wm H Watson	302 Montgomery at	Stock	Mar 27
Alta S M Co	Ely District	C S Swire	419 California at	1 00	Apr 10
Belcher M Co	Washoe	H Q Kibbe	316 California at	2 00	Mar 23
Black Bear Quartz	Cal	W L Oliver	401 California at	2 00	Apr 10
Cons Virginia M Co	Washoe	Chas H Fish	401 California at	2 00	Apr 10
Empire M Co	Nevada Co Cal	D J Jennings	401 California at	2 00	Apr 10
Empire M Co	Sierra Co Cal	Chas Collihan	401 California at	5 00	Mar 15
Indian Queen M & M Co	Cal	A K Durbow	Merchants' Ex	50	Apr 5
Lady Bryan S M Co	Washoe	Wm H McCintock	419 California at	Stock	Apr 15
Leopard M Co	Nev	R H McCintock	402 Montgomery at	25	Feb 28
Northern Belle M & M Co	Cal	W Wille	309 Montgomery at	1 00	Apr 15
St Patrick M Co	Cal	D F Verdonal	409 California at	30	Mar 10
West Coast G & S M Co	Washoe	Oliver G Wood	534 California at	50	Feb 24

Irrigation in India.

The Academy of Sciences held a meeting on Monday evening. President Davidson delivered the first of his lectures on the subject of irrigation. During his recent travels abroad Prof. Davidson has made a study of the systems of irrigation in the different countries visited and will address the Academy on each of them. The paper on Monday was devoted to Indian irrigation and was extremely rich in interesting details, and in the value of its conclusions applied to the necessities of artificial water-courses in California. The lecturer said that the Indian canals had not paid private capital, and had been assumed by the government, which is projecting and building a magnificent system of irrigating works. The people of India are deficient in self reliance, but have a plodding industry, and look to the government for aid in seasons of drouth. Their implements are so contrived as to secure minimum results from a maximum of labor. The government engineer makes his agreement in the native language or dialect with native contractors, who furnish the laborers and control them, and though these generally contrive to do as little work as possible with the least effort, contracts are filled in time and specifications. The lecturer described the Gangetic plains and other valleys of India, which present many features similar to the country adjacent to the Rocky mountains and Sierra Nevada range. The Himalaya Mountains are the great storehouse for the gigantic arterial water system, and the mountains of the Pacific slope are to furnish inexhaustible supplies for our valleys. The completion of the government engineering projects will add to the commercial prosperity of British India and add to the stability of the government. The English engineers found themselves obliged to discard the precepts of science in some particulars. Professor

Davidson stated that he inspected all the works in the country, under governmental auspices, and had every facility to note the labor and scientific problems. Though as lazy that an Englishman's patience would be exhausted and an American go wild, the skilled laborers execute masonry and other work equal to our own. They have no machinery. The common laborer receives six cents a day, the skilled mechanic twelve cents.

The Professor gave it as his conclusion on the subject, that the hydraulic architecture to be built in California, could be constructed at less cost in the aggregate than those in India. We have steam and machinery. Forty thousand men were at one time employed by the Indian government on the canals. In answer to a question from a member, Professor Davidson stated emphatically that his calculations were on the basis of white labor at fair wages, and not Chinese cheap competition, a question and answer which proved the exciting cause of a little scientific smiling. The paper, which was very elaborate, was illustrated with maps, and was listened to with the closest attention. A vote of thanks was passed.

THE HEBREW AND CAPITAL PROMISEMENT.—Our readers are very generally aware of the great effort that has been made to save the life of the Hebrew Rubenstein, who has been sentenced to be hung, at New York, on the 24th inst. It is claimed that he is a victim of circumstances, and that his innocence can be made to appear if he can only get a new trial. His co-religionists evidently believe him innocent, and that belief is, no doubt, greatly strengthened from the fact that he is the first of his faith upon whom the death penalty has ever been pronounced in this country. The Jews are naturally proud of this record; and thus, although the accused is poor and belongs in the lowest stratum of society, no effort or money has been spared to procure a new trial. These efforts were crowned with success just in the nick of time, and the coveted stay of proceedings obtained.

MINING SUMMARY.

THE following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

California.

BUTTE.
MORRIS RAVINE AND CHEBROKE.—Groville Mercury, April 7: At Morris ravine, in the Hendricks claim, four chiefs were at work sending a large stream of water from each upon the bank of soft earth, which seemed to melt away before it. In this claim the bank upon the right hand is continually breaking away and sliding down into the ravine. A portion of the earth seems to be a kind of paste, and as fast as the earth in the ravine is washed away, this slides in and fills up the space. Owing to this, the workmen do not seem to make much headway, and are continually at work upon the top dirt that pays but little. Sometimes the moving mass will become stationary for a time, and quite a piece of bedrock is cleaned up, always with the best of results. This ravine is still one of the richest places on the earth. Where the mining is now being carried on the gold is coarse, and there is a good deal of it. It will be some years before all of this part of the ravine is mined out. As capital is now turning this way for new fields in which to invest, it will not be long before water will be brought here in quantities sufficient for all the purposes needed, and then we shall be able to tell a tale of mining never before equaled in this State. At Chebroke we met George W. Dyer, foreman of the Spring Valley company's crew of men. It was not long before we received an invitation to visit the claim and see the place where \$95,000 worth of gold dust had been taken out within the last 30 days, and where as much more will come from the same place. A road and an island in the claim—it seemed like an island, as the earth had been washed away on all sides down to the bedrock—standing up in the form of a cone, about 30 feet high, with a diameter at the base of about 450 feet or more, were planted six chiefs. When all were in operation at the same time, the noise was not unlike that of a mighty cataract. One of the chiefs has a seven inch nozzle, and sends a stream of water that would soon level to the ground the most substantial brick building in the county. It tears up the earth in great flakes, sending mud, stones, water and gravel high in air, while a stream of muddy water is running into the flume, carrying with it the gold, which alone is the cause of this terrific onslaught. The company has an abundance of rock ground before them. An immense derrick has recently been erected, supplied with a sturdy gurdy wheel, run by water, which is contrived as to be worked by a few men. It catches up rocks weighing tons and swings them out of the way with ease and rapidly. About 200 men are employed about the claim.

CALAVERAS.
MINING ITEMS.—Calaveras Chronicle, April 8: There is no cessation of work in the numerous hydraulics in this vicinity. Cook, Haywood & Cook are running their great hydraulic on the Calaveras day and night. They are using 500 inches of water under a 250-foot pressure. The Earl & Raynor, owners of the most powerful hydraulic, have just finished cleaning up after a somewhat extended run. The ground is so rich that they are compelled to empty their flume frequently. Veith has also taken up his rifles lately, and is now ready to resume panning. Mozer, of Spring Valley claim, is also cleaning up, and is taking out a sum that would be a fortune to many ambitious men. Cook & Co., at Red Hill, have got through with the deep part of the claim and are washing surface. We are glad to know that the ground is yielding well. The chances are good that there will be no diminution of the water supply until late in the season, and that hydraulic operations can be continued until a much later date than usual. Rich ore has been struck in the Josephine mine at West End. A contract for sinking the shaft has just been let. Gamble, Ellsworth & Co. have just concluded a crushing of 100 tons of ore in Clark's mill at Railroad. The rock was divided into two grades, the first paying about \$40 and the second \$15 per ton. Lewis & Fairchild have lately discovered a new lead in the Glencoe district, and are taking out a crushing of good ore. The progress is being made in putting up the San Bruno machinery. All the water was got out of the Crassopher last Thursday. Additional stamps have been put in motion at the Gwin mine—46 in all. An abundance of good ore is being taken from the 1100-ft stopes to keep the batteries in constant operation, and the yield of the mine is from \$12,000 to \$15,000 per month. The outlook for the mine is very encouraging, the prospect being good, that the mine now being worked will net more money than did either of those near the surface.

COLUSA.
AMOR MINE.—The following is from the monthly report for March of the Superintendent: Amount of ore reduced, 1,608 tons—23 days' run with new furnace, and six days with the old. Production, in flasks, 84; pounds, 6,426; percentage, 1.99. We are now in good working order, with both furnaces. Have commenced to make adobes. This will give us a chance to sort our rock, and we can commence to accumulate ore for next winter. Our expenses have been large this month, on account of permanent improvements. I have just opened new ground in north end of mine. The lower gulch tunnel is in 442 feet. We have made 100 feet this month; 51 feet more brings us in connection with the shaft—which will be completed by first week in May. This work will give a large percentage to the resource of the mine. The bank of the gulch is looking well, and the indications are that we have enough ore in this part of the mine to keep the furnace running all summer. If the price of quicksilver should advance, we have a fine prospect before us. The indications are that we have several years' work before us in the lower gulch tunnel. This month I have been giving particular attention to the high part of the mine, 300 feet above the east end works, where I am satisfied we have a large body of ore yet unseen. The mine in general is in good condition, and will continue to pay, unless quicksilver should go below 30 cents per pound.

FRESNO.
QUARTZ MINING.—Expositor, April 5: It is strange that with the best of the quartz veins known to exist in Fresno county not a single mine has been developed sufficiently to be pronounced a permanent paying mine. Many of the veins prospect exceedingly rich, and the surroundings are such as to indicate that they are permanent mines, but from some cause or another they are not fully and thoroughly prospected. The major portion of the quartz ledges have not been prospected to a greater depth than three or four feet. The work now being prosecuted on the Confidence mine is more important than anything yet attempted in the county. If a good ledge is developed by the tunnel at the depth of 150 feet, it will probably stimulate other companies to prospect their ledges to a greater depth.

INYO.
TUNNEL.—A correspondent of the Californian writes that the claimants of this mine had worked the lead for several months and so satisfied some San Francisco men of its great value as to induce them, for a one-half interest, to put up a mill. Mr. Harley, the purchaser, had already shipped the machinery, and ten tons of it is now on the way from California.

FURNACE FOR THE KEARSARGE.—Inyo Independent, April 7: Mr. L. C. Gray, of the Kearsarge mine, will soon be here with a furnace with which to roast the richer but more rebellious ores from the Kearsarge.

It is a "Buckner" furnace, and was shipped from Cincinnati, its place of manufacture, on the 17th of last month.

KERN.
ANTIMONY MINE AT SAN EMIDIO.—Bakersfield Southern Californian, April 6: The furnace is now being erected. The chimney is 75 feet in height. From eight to 10 tons will be smelted at the furnace, and the second furnace will be constructed during the month. The work of the furnace is under the direct superintendence of Mr. Madison, from Newcastle, England, whose life has been spent in working similar ore. Messrs. Star & Madison, of San Francisco, have prepared 33 furnaces for refining the ore from this mine, and are now awaiting the first shipment. They will refine from 75 to 100 tons per month of crude ore. The rock is valued at from \$40 to \$50, the crude ore from \$80 to \$100, and the Star regulus \$300 per ton. In New York, about 10 tons of the rock have been sent to different parts of the United States and Europe to be tested. The rock sent to Messrs. Chandler & Co., of New York, yielded 63 per cent of antimony. The rock is composed of antimony, silver, nickel and sulphur. The crude ore consists of 75 per cent of antimony and 25 per cent of sulphur.

LOS ANGELES.

PINO MINES.—Los Angeles Express, April 8: Mr. Jones, of the firm of Jones & Noyes, has exhibited to us a piece of gold, about two pounds, which was ground eluted out of a mine belonging to himself and others in six days by three men. The gold is very pure, and is worth about \$19 per ounce, and the package shown us would therefore be worth about \$460. The company have a very large claim, which is located in the Flin placers, about 50 miles from here, at the edge of Ventura county, where it joins Los Angeles. Mines in that vicinity have been worked on and on for the past 40 years, and a great deal of gold has been extracted from them. The entire region is auriferous, and good placers may be found almost anywhere. The great difficulty to successful mining has been in the paucity of water. A number of schemes have been inaugurated at intervals to bring water to these placers from Elizabeth lake, and two years ago very extensive work was done on a large ditch from that point.

NAPA.

ETNA.—St. Helena Star, April 8: The stockholders of the Etna mining company held a meeting at Napa, last Monday, and elected seven new trustees to serve for the ensuing year. The company includes a number of stockholders in St. Helena. It is contemplated to raise what funds may be needed in small assessments, so as not to bear too heavily upon stockholders, and by easy stages place the mine in a position for business. It is proposed also to sell the engine and pumps belonging to the company, which under a true line of policy are not expected to be needed. The Silver Bay will probably be the future seat of mining operations.

NEVADA.

GRANITEVILLE.—Transcript, April 5: The Eureka Lake company, the North Bloomfield and Milton mining company, have a large force at work on their ditches to clear the snow out, and expect to have them all running by the last of this week. If another heavy fall of snow does not catch them out. The California mill is running to its fullest capacity. The company are taking out a considerable quantity of rock from the Rocky Glen mine, will commence crushing in a few days. Hebert & Co., who have a fine ledge, and have taken out a considerable quantity of rock from the Rocky Glen mine, will commence crushing in a few days. Hebert & Co., who have a fine ledge, and have taken out a considerable quantity of rock from the Rocky Glen mine, will commence crushing in a few days. Hebert & Co., who have a fine ledge, and have taken out a considerable quantity of rock from the Rocky Glen mine, will commence crushing in a few days.

SAN BERNARDINO.

PAYTON.—San Bernardino Argus, April 6: The last six tons of ore taken out by the McFarland assayed \$2,350 to the ton. They take out about \$50,000 a month, and it costs them \$300 a month to run the mines.

SISKIYOU.

EMPIRE.—Yreka Journal, April 7: The Empire quartz ledge, on Empire creek, below Humboldt, on the opposite side of Klamath, still continues to prospect rich, and the company intend opening it on a more extensive scale, by running a tunnel to strike it lower down, in order to afford drainage and more successful working of the mine. The company have also let a contract to sink the shaft 50 feet further down the top, and will run their shaft in crushing the quartz on hand and to be taken out, until they can make arrangements to put up a mill.

CHINESE MINING.—The Chinese hydraulic company, who carry on hydraulic mining on Spring gulch, north of town, and have a lease of the big ditch, sent out a large gang of Chinese yesterday to repair the flume, and cut out the ditch towards its head, so as to keep up a supply of water from Shasta river when the feeders in this vicinity give out during the summer months.

Nevada.

WASHOE DISTRICT.

YELLOW JACKET.—Gold Hill News, April 6: The prospecting operations in this mine are now principally confined to the developments of the ore vein at the point where the body of rich ore was struck some two weeks since. At that point drifts have been accumulated since the last of this week, if another heavy fall of snow does not catch them out. The north-east drift from the bottom of the winze on the 1940-ft level is also looking very favorable for striking the same body of ore. The same may also be said of the southeast drift from the bottom of the south winze on the same level, as almost precisely the same formation and in fact both north and south winzes are met with in the middle cross-cut before striking the ore.

MEXICAN.—The only work now being done in the mine is the running of the northeast drift on the 1455-ft level. The course of this drift has been changed until it is now running east of and parallel with the ledge. In places where the drift has touched the quartz it shows finely.

CONFIDENCE.—The face of the main adit tunnel, following the vein northward, is still in good milling order, but owing to bad air, full dumps and an upraise which is being made at that point in the heat of the ore body, work in the face of the drift is temporarily discontinued. Nothing being done in or

suspended for timbering purposes, has been resumed and is being pushed actively ahead, the bottom in good blasting ground.

UNION CONS.—The north drift on the 1300-ft level is being steadily pushed ahead, the face in more favorable ground than for some time past. The bottom of the winze below the 1300-ft level is in quartz and low grade ore, and is looking well.

CHARLES POTTS.—The extraction and milling of ore was resumed on the 1st inst. There are no changes to note of either of the prospecting drifts on the 1250 and 1350-ft levels. Sinking the new combination shaft is making splendid progress.

CALIFORNIA.—The breasting of ore and its extraction was commenced on the 1500-ft level on the first of the month, and yesterday morning the California mill, with a daily crushing capacity of 300 tons of ore, commenced reduction. No mine on the Comstock ever so systematically opened and prepared for a favorable beginning, and no mine on the Comstock ever had at one time such an immense amount of rich ore ready to hoist to the surface as the California. While the number of tons taken out this month must be limited, on account of the inability of existing mills with which to crush it, the character of the ore now being extracted is such as to leave no doubt of the payment of a handsome dividend at the end of the first month's crushing. The ore will probably yield from \$500 to \$700 per ton. Sinking the winze below cross-cut No. 6, on the 1550-ft level, to connect with the Ophir mine, is going steadily progress, the bottom still in rich ore. The north drift on the 1400-ft level has not yet connected with the Ophir, a survey made showing the distance to be run to be greater than supposed.

WARD.—This mine comprises the old Ward location, lying immediately south of and adjoining the Julia, along with 400 feet of ground segregated from the Julia. A stock dividend of three-quarters of one share to each share of the mine was given to the stockholders of the Julia company in consideration of the purchase of the company's ground. To obtain a working capital a limited number of shares were readily disposed of to men of capital at \$3 per share, leaving a reserve of 27,500 in the hands of the company. Yesterday morning ground was broken for a fine three-compartment shaft at a point 1,450 feet south and east of the Julia shaft.

CONSOLIDATED VIRGINIA.—Daily yield, 650 tons of ore. This decrease in the amount of ore extracted is due to no change in the mine whatever, but is caused by the strutting up of the California mill, with a crushing capacity of 300 tons per day, on ore from the California mine. This mill makes a difference in the amount of ore extracted of 900 tons, and a corresponding reduction in the monthly bullion receipts. The mine shows no visible change during the week, and the bullion returns for March amounted to the neat little sum of \$3,624,218.72. The usual dividend of \$1,050,000 was declared yesterday, with a large reserve carried over for time to come. Sinking the O. & O. shaft is going steadily ahead, although the flow of water at the bottom interferes to some extent with the progress of the shaft. The east drift on the 150-ft level, running down the O. & O. shaft, is steadily advancing. The diamond drills being used well, and are expected to prevent at any time the flooding of the drift by water.

OPHIR.—Daily yield, 150 tons of ore keeping the mills all running up to their full crushing capacities. The ore hoists on the 1600 and 1200-ft levels show no changes worth noticing during the week. The east drift on the 1600-ft level has penetrated to the ore vein, which is showing finely at that point. The upraise above the 1200-ft level is connected with the east drift on the 1100-ft level is making steady progress to very favorable ground. The east drift on the 1100-ft level is still in quartz and low grade ore. The east shaft has been cleaned out and repaired to the bottom on the 1700-ft level. The new incline machinery was started up for a trial a few days ago, everything working with the utmost perfection. The new office is nearly completed. With the present favorable opening the yield of bullion for this month will, without doubt, be considerably increased.

JULIA.—Sinking the shaft is making the usual good progress, the bottom still in soft clay and porphyry and quartz. The main southwest drift on the 1400-ft level is being steadily pushed ahead, the face of the winze showing change during the week. The main southwest drift on the 1400-ft level is rapidly advancing, the face showing more favorable indications.

HALE & NORCROSS.—The water stands at about the same level in the shaft as heretofore reported. The old machinery is being taken out and excavations made for the foundations for the new and powerful pumping machinery now in course of construction. **BULLION.**—The main southwest drift on the 2000-ft level of the Imperial shaft is steadily advancing, the face in the black dyke that is almost invariably found lying next to the west wall of the ledge on that portion of the Comstock. The material in the face of the drift is gradually softening, with strong indications of water. The raise from the 1700-ft level is steadily advancing, without change. The winze being sunk below the 1400-ft level to connect with this raise is also making good headway. Sinking the main incline below the 1400-ft level is also making steady and favorable progress.

CROWN POINT.—The cross-cuts on the 1600-ft level have developed a fine ledge of quartz and ore 65 feet in width, but nothing whatever that will pay for extraction and milling. On the 1700-ft level the ledge is much wider, and well defined, but, like the level above, shows nothing better than low grade ore. Work is being energetically carried ahead at all points.

LADY BRYAN.—The entire mine is shut down in order to take out all the old hoisting and pumping machinery and put in new, of the same pattern and power as that now in use at the Caledonia and Dayton mines. The mine was never showing better than at the present time.

SIEBERA NEVADA.—Sinking the main shaft is going steadily forward without change or hindrance. The east and west prospecting drifts on the 1500-ft level are being steadily advanced, with no important changes to report. The prospecting drifts on the 1250-ft level are also making good progress, and are looking quite favorable for the speedy development of a much more encouraging mine. The south drift on the 1000-ft level, running to connect with the bottom of the winze from the 700-ft level of the old shaft, for air purposes, is making good headway.

SILVER CITY.—The mill is kept running to its full capacity on ore from the mine, and a good showing of amalgam is being made, giving assurance of an excellent clean-up. The first shipment of bullion will be made the first of May. The ore breasts and scopes from all three raises, above the main tunnel, on the 1000-ft level, are showing and yielding splendidly, and the face of the south end drift is in low grade ore.

JUSTICE.—The extraction of ore has been commenced from both the 400 and 600-ft levels, and it is being sent to the mills for reduction. The main south drift on the 500-ft level is being cleaned out and repaired as rapidly as possible. The main north drift on the 500-ft level is being pushed steadily ahead, opening the 1000-ft level is going steadily forward with good prospects of soon reaching the ore vein.

DAYTON.—The north and south drifts, on the 500-ft level, are steadily advancing without change of inclination. No change to report of the main south drift, on the 300-ft level.

BELORE.—Daily yield, 650 tons of ore, keeping the mills steadily running. The ore breasts show little or no change during the week. The mine is looking well throughout. The ore prospects in the winzes below the 1600-ft level are steadily on the increase. The erection of the new pumping machinery is making satisfactory and fast progress.

SILVER HILL.—The water was drained from the main incline during the latter part of last week, and the sinking resumed. Two or three heavy blasts were exploded, when a fresh flow of water was encountered, which drove the men out and has prevented any work in the bottom since that time. The heavy 14-inch pump

columns are being now placed in the incline, and it will be but a very few days before the water is extracted and the sinking resumed.

BALTIMORE AND AMERICAN FLAT.—Sinking the main incline is making excellent progress, the bottom in good sinking ground. The main east drift on the 1050-ft level is steadily advancing, without change of interest. The north and south drifts, on the 1050-ft level, both show an increase of quartz, which is also generally increasing in value as the drifts advance.

UTAH.—Sinking the shaft is going steadily ahead, the bottom in hard blasting rock. The flow of water is still very strong and impedes the progress to a slight extent. A sufficient depth will be reached in two weeks, more to permit of opening another station at the 750-ft level, which will give a depth of 350 feet of entirely new ground to prospect.

GOULD & CURRY.—The repairs to the shaft are being pushed steadily ahead. The north drift on the 1700-ft level is being repaired and put in working order as fast as the work can be accomplished.

SULLIVAN.—The main cross-cut east is now in 265 feet from the west wall, and is being driven ahead lively, both day and night. No sign of east wall as yet, and better ore and more of it at present in the drift than ever before. A strong flow of water is coming in, yet not enough to impede work.

GLOBE CONSOLIDATED.—Both the north and south drifts on the 350-ft level are steadily advancing along the line of the ore vein, the face of each in very favorable ground. It is the intention to commence the cross-cutting of the ledge, both north and south, in a very short time.

NORTH CARSON.—The new hoisting machinery for the mine has arrived and is being put in position as fast as possible. The mine itself is showing splendidly, with increasing good prospects as further development is made. The shaft is being steadily advanced, with the best of Belcher. There is nothing doing in the mine at present, except the cleaning out and repairing of the connecting drift with the Gould & Curry, on the 1700-ft level.

KOSKUTZ.—The main south drift on the 350-ft level is showing some rich gold ore. The prospects of the ledge going south is steadily on the increase. The main drift on the 500-ft level are steadily advancing, running parallel with the ledge and occasionally cutting thin chutes and streaks of fine quartz and ore.

LEVATHAN.—Shaft 597 feet deep. Bottom in ledge matter, principally low grade ore, with rich streaks, which give high assays.

IMPERIAL.—The north drift on the 2000-ft level is steadily advancing, the face still in ore of a fine character. There are no changes to note in other portions of the mine except that using the air on the 2000-ft level has suspended all work on the 1300-ft level for the present.

NORTH CONS. VIRGINIA.—Sinking the shaft is making excellent progress, the bottom still in soft porphyry with streaks of quartz of a very favorable character.

SAVAGE.—The excavations for the new pumping machinery are going steadily forward. The stations in the shaft for the new pump-holes and water tanks are nearly completed.

AMAZON AND GLASGOW.—The water has been drained, and sinking and prospecting the 300-ft level resumed, with every prospect of speedy and valuable ore developments.

NORTH DAYTON.—The face of the main north drift shows continued improvement, the rock getting softer and more stringers of quartz coming in, which give good assays.

TRONAN.—The hoisting works building and the carpenter shops are fast approaching completion, the work being driven ahead with all possible energy.

SENATOR.—Work has been resumed, and the shaft is being drained of water. As soon as the water is drained sinking will be resumed. There is no flow of water at this time.

WEST BELCHER.—The drift west for the ledge is now in 52 feet and driving ahead at a lively rate, the machinery and everything working well.

CALEDONIA.—Sinking the shaft is making good headway, notwithstanding the steady, strong flow of water. It is now down 1,015 feet.

PROSPECT.—Diamond drill still in the ore vein and giving very fine assays from the horings. Shaft progressing downward at a good rate.

NIAGARA.—The main incline is now down 265 feet, the bottom in a very favorable formation, and the sinking making good progress.

VIVIAN.—During the week 22 feet have been added to the main south drift. The main north drift on the 300-ft level has again passed into fine ore. The ore is now being mined.

SUTRO TUNNEL.—Total length this morning, 12,740 feet. Material in face of header softer, with more water coming in.

(Continued on Page 252)

SINGULAR COINCIDENCES.—On Tuesday, the 23d of February, at the same hour of the day and the same minute of the hour, Deacon Noah Pesse and his wife Lucinda, of Ellington, who were united in marriage over 63 years ago, passed away from this life together, and entered upon the life to come almost without any separation, even by death itself, and this not by the same disease, but by diseases entirely distinct and unconnected. Both were over fourscore years of age. This may be well called a rare occurrence. —Rockville (Conn.) Journal.

We can match the above by the following occurrence which is said to have recently reached its climax at the places named in this State: "A few years ago, there resided at the Mission San Jose, in Alameda county, two young ladies, between whom, although not of kin, a strong friendship existed. They were married at the same time and by the same service. They took up their residences, one at Hayward and the other at Alvarado. In the course of time they gave birth to children on the same day, the birth of one child preceding that of the other by two hours. Three weeks later both children died on the same day, the eldest dying just two hours before the other. Three weeks after the death of the children both mothers died on the same day."

BISMUTH ORES.—J. Mosheimer writes as follows to the Sonora (Tuloume county) Independent: "Amongst the great variety of sulphurets, and other ores which abound in your county, I have no doubt that by careful searching, bismuth can be found—as I had once a sample, but did not hear of the locality. Bismuth is found as native metal, then in sulphurets combined with copper, iron, arsenic, tellurium, selenium, etc. There is also an oxide of bismuth of a yellowish color, looking like ochre (oxide of iron). It is now a valuable metal; is worth about \$3 a pound. It may be found in many ores in your county, but I doubt very much if ever a piece of ore from there has been tried for it. My attention has but lately been called to it, and it may be of much value to some of your prospectors as it would be to find a gold mine."

THE ENGINEER.

Great Bridge Enterprise.

This appears to be an age of stupendous enterprises in the way of bridge building. No sooner is one work of this kind completed than we have multiplied projects for others, each more difficult and daring than its predecessor.

The bridge now in process of construction between New York and Brooklyn is the most formidable work of the kind yet undertaken. Since the inception of this enterprise numerous others have been started or suggested in various parts of the country. It is now in contemplation to build a second bridge to connect New York with its suburban population on the western shore of Long Island, a few miles above that which will soon span the East river from the City Hall park.

There is also another for which a contract has just been let, which is to cross the Hudson at Poughkeepsie by five spans of 520 feet each. This will be what is termed an undergrade or deck bridge, having railway tracks above and a carriage way below. Its total length will be 4,500 feet. The erection of the structure is understood to be a preliminary step to the proposed opening of a new line of railroad between New York and Chicago, which, it is affirmed, will be but 921 miles in length, or 59 miles shorter than the shortest existing route.

A gigantic new bridge is also about to be built across the St. Lawrence at Montreal, to accommodate street cars, carriages and foot passengers, as well as railroad traffic. A viaduct 4,800 feet long, in 20 spans, will conduct from Sherbrooke street to the river, five spans of 600 feet each will cross the river to St. Helen's island, which will be traversed by a viaduct with 20 spans of 120 feet each, while 12 spans will cross the unnavigable channel south of the island—making the total length of the bridge 10,200 feet, or nearly two miles. The bridge will cross the navigable river channel at an elevation of 130 feet above the water!

The longest iron bridge in the United States is the St. Charles bridge over the Missouri river, which, with its seven spans and opposite river approaches, is 6,535 feet in length. The greatest engineering difficulty which had to be encountered in planning this structure, was the strength required for its central piers, the caissons for constructing which had to be carried down from 54 to 76 feet through water, quicksand, large boulders and heavy imbedded driftwood, and planted with sufficient firmness to resist freshet rises of 40 feet, with a current of nine and a half miles an hour of flood speed, often carrying floating islands 300 feet in diameter and drawing 20 feet of water. All these difficulties have been overcome at nearly double the estimated cost, however, and the bridge now stands as one of the proudest monuments of successful American engineering.

A Second Channel for the Erie Canal.

One of the latest engineering projects in America is the construction of a second canal for the Erie canal. This project is designed to take the place of the proposition for widening and deepening that great interior water way. The expense of constructing a second canal will be but little more than that which will be required for widening the present one, while the relative advantages will be much greater. The proposition is to commence at its western extremity and give a uniform down grade of about seven inches to the mile, by which a three mile current will be established, and to use this second canal for transportation eastward only—utilizing the force of the current as a motive power. It is, moreover, proposed that the new channel shall be three feet deeper than the present one, so that as the excess of transportation will always be in the direction of the current, boats going eastward may be able to draw three feet more water than on their return trip. The present canal admits a draft of six feet; by increasing the depth to nine feet most of the sailing vessels now on the lakes could make the passage seawards by the canal fully laden, and return with a limited cargo—all that the business will admit of. Of course such navigation will require the use of drawbridges.

It is claimed that by the aid of the three mile current, the down-going boats would be able to double their present speed, and quadruple the capacity of the canal, while the cost of freight might be greatly reduced, without any reduction in the present rate of tolls. It is estimated that the sum of \$35,000,000 will be amply sufficient to construct the new canal from Buffalo to Rochester, within five years from the inception of the work; then by allowing the tolls to accumulate for a few years the State might commence the construction of another section, and so on until tide-water was reached—always keeping the tolls at figures that would not allow the canal to become a financial burden. The chief novelty in the idea is the double canal, which appears to present an economical, as well as novel feature; and is one which will apply to other canals or parts of canals, whenever water is plentiful and the down grade sufficient. Communication between the two canals could be established at certain intervals by connecting channels, which, of course, would usually have to be provided with locks, as the two channels would seldom be on a level with each other.

Narrow vs. Broad Gauge Railways.

There are few questions of greater importance now being considered by engineers than the simple proposition as to the proper width of railway tracks. We have now in the United States six different gauges, as follows: Six feet, five feet, four feet ten inches, four feet eight and one-half inches, three feet, two feet and six inches, besides a three feet and six inch gauge in Canada.

English engineers formerly held that seven feet was the proper gauge for ordinary traffic, while where it was desirable to attain 50 and 60 miles an hour, a still wider gauge was required and used. Their experience, however, has led, for economical reasons, to a decrease in the width and a corresponding decrease in speed, until 25 and 30 miles an hour is now considered the highest practical speed which can be economically kept up. English engineers have thus come down to the American idea in this regard. It has been found that the operating expense for any higher rate of speed is beyond the endurance of finance. Indeed, it is said that every broad gauge road has thus far proven a financial failure. It moreover appears that even with a broad track already graded and the rails in place it is found expedient to incur the expense of narrowing the track, even at the great cost thus involved in the change of rolling stock as well as of rails. The American idea is thus coming into general acceptance in England.

The question at once arises, how far may the gauge be reduced? This is as yet a matter for future solution. Just now the extreme narrow gauge is favored for all short feeding lines and a moderately wide gauge for principal and through roads. So much enquiry has lately been elicited in this direction, that about a year ago an interesting pamphlet containing the history and statistics of narrow gauge railways in this country, was published by Mr. Howard Fleming, of Philadelphia. A second edition of this work has just been issued, containing many additional features of interest, embracing a record of the progress made during the past year, statistics of mileage since 1871, reports of the various roads, with grades, curvature, weight of rail, construction formula, rolling stock equipment, financial condition, etc. The new edition has been very much enlarged and improved, and will be a valuable source of information for all who are interested in this class of roads. Mr. Fleming's address is 311½ Walnut street, Philadelphia.

The Proposed English Channel Tunnel.

A late Paris correspondent of the London Times says that the question of the Channel tunnel is steadily advancing. An international company, it is well known, was formed, with a capital of \$800,000, to be furnished in equal moieties by French and English shareholders. The first step succeeded, and the English company, which was behind in raising its capital, has been for some time provided with the requisite sum. A second step was then taken. The promoters were told that, as they meant to risk \$800,000, it was better that they should immediately appeal to capitalists, and constitute themselves definitely.

This advice was not followed. They thought it better to risk their own capital, and not appeal to the public until experiments had been made and nothing was left to chance. This determination was promptly justified. The preliminary expenses have only amounted to an insignificant sum, and the promoters have already acquired a certainty that they may make decisive experiments; and when these have been made they will resolve either on the entire abandonment of the scheme, or on a definite enterprise, guarded against all eventualities and miscalculations, so that whenever they present themselves before the public they can precisely determine the time, cost and nature of the undertaking.

AGRICULTURAL ENGINEERING.—Scientific agriculture has made such progress in England that it has been found advisable to organize there an "Agricultural engineering association" to look after and advise with regard to the general interests of that industry in England. Among other matters which this association has had under advisement during the past year is a memorandum to the Royal agricultural society of England, in which they complain, among other things, of the multiplication of agricultural shows, and increased charges on entry and freight. The most weighty, however, of the complaints is the want of time of the judges to estimate the value of an agricultural implement, and they submit "that no judgment should be pronounced on any standard agricultural machine unless it has been at work, performing its ordinary duty, for a considerable time under the eye of the judge. This would be most satisfactorily accomplished by placing the implements in the hands of experienced agriculturists for at least a whole season, on the conclusion of which they might be submitted to dynamometric trial. After such probation it would be sufficient if an accurate and detailed report were given of the duty performed and condition when ceasing work. Steps should also be taken to compare implements so tried as to their construction with the ordinary commercial productions of the same exhibitors."

USEFUL INFORMATION.

Hints for Practice.

Glue holds more firmly when applied to the fibers cut across than to a cut parallel to the fibers.

Soaking wood at 80 to 100 degs. C. in linseed oil for two or three days increases resistance to fracture. It is believed that the increased toughness is due to increase of the density of the wood.

TASTEFUL ORNAMENTS may be made of natural leaves and sprays artificially frosted. This is done by means of powdered glass, which can easily be obtained by pounding some bits of glass with a heavy hammer, care being taken to protect the eyes against flying splinters. Dip the objects in thin gum water and shake the powdered glass over them. When dry, handsome bouquets can be arranged.

GLUE frequently cracks because of the dryness of the air in rooms warmed by stoves. An Austrian contemporary recommends the addition of a little chloride of calcium to glue to prevent this disagreeable property of cracking. Chloride of calcium is so deliquescent a salt that it attracts enough moisture to prevent the glue from cracking. Glue thus prepared will adhere to glass, metal, etc., and can, it is said, be used for putting on labels without danger of their dropping off.

THE *Housekeeper* gives the following suggestions for utilizing old tin cans. Take off the top of the can, punch holes on opposite sides near the rim, put in a wire bail, and you have a little bucket, which may serve for a paint pot, to keep nails in, or other handy purposes. Take off the top, cut to the proper shape, and fasten on a handle by means of a screw through a hole in the bottom, and a useful scoop may be made. A saucerpan for small masses may be made by cutting down a can, leaving a strip to be bent at right angles, and turned round a stick, to serve as a handle. A coarse grater for crackers, etc., is easily formed from a piece of tin fastened to a board. The holes in the grater should be made with an old three-cornered file.

The Uses of Tannery Refuse.

The *Journal of the Society of Arts* describes a number of uses which can be made of tannery refuse. The refuse consists of untanned dried pelt or glue pieces, fleshings, hair, lime deposit, and spent tan. The glue pieces are used for two purposes, the principal of which is the manufacture of gelatin and isinglass. For this industry thousands of tons of the scraps are sold. The dry untanned portions find their second utilization in paper making, and they are also used for the manufacture of peckers or hammers, for knocking to and fro the ever-flying shuttle. Ordinary size is made from the flesh refuse of the hide, and is extensively used by paper hangers, cotton spinners (to give firmness to the thread), and carpet manufacturers. As to the hair, there has been little demand for it since speculative builders have discovered a mode by which ceilings can be made to retain their positions for a time without its use. Unhappily the demand for cheapness has stimulated the makers of inferior clothing and blanketing to mix hair with wool, thus rendering the fabric heavy without in any way adding to its warmth-retaining capacity. Hair is also used in the fabrication of horse cloths and railway rugs, and, strange to add, the cheap (so-called) sealakin jackets largely sold in England are made from the same material.

A profitable use for spent tan, other than as fuel, remains yet to be discovered. Liebig says that it is valuable as a manure when wholly rotten; some have tried to turn it into charcoal, and to light their tanneries with its gas, but the results have not been very satisfactory. A new process for using this refuse instead of charcoal in the manufacture of tin plates has lately been tried in Wales, and seems likely to be advantageous and useful.

The lime grounds or deposit, although not used for the purpose, is an excellent manure. It contains a mixture of salt, blood, lime, and gelatin. Its analysis is as follows: Moisture, 54.05, organic matter, 6.80, silicon, 2.55, iron and alumina, 0.84, phosphate of lime, 1.85, carbonate of lime, 12.42, caustic lime, 17.44, common salt, 4.05; total, 100.

PHOTOGRAPHY AS A DETECTIVE.—Recent attempts at forgery, by the alteration of dates and amounts of written checks and drafts, have resulted in investigation as to how erased writing may be rendered visible. Various chemical processes, more or less efficacious, have been suggested, but the simplest process yet devised seems to be the photographing of the unspectated paper. This is founded on the fact that certain colorless or feebly colored substances, while very slightly affecting the eye, set powerfully upon the sensitive film in the camera. Photographers are aware that a photographic proof nearly effaced through age may, by photography, be reproduced with all its primitive detail and intensity. Generally all yellowish stains may thus be brought out; and peroxide of iron in the smallest proportion, so as to be practically imperceptible to the eye, gives proof of great clearness. Common ink, says M. Gobert, to whom is due the credit of the suggestion, is a compound of tannin and oxide of iron. Now it matters little what chemical means are used to remove ink marks; for however coarsely the chemical be applied, some

traces of peroxide of iron are sure to be left either on the surface or in the substance of the paper. It is only necessary, therefore, to photograph the sheet, and to enlarge it besides to bring out in the proof the effaced writing in an entirely legible condition.

Keep Coal Under Cover.

That most of the true bituminous coals (English and American) are subject to spontaneous combustion when in bulk, and under favorable circumstances, is well known, and even when lying in large heaps, exposed to the atmosphere, there is certain waste and deterioration that takes place, attributed to a slow combustion. The waste of fuel, however, exposed to air, depends on its igniting temperature. Experiments by Greenmann, at Tarnowitz, in Germany, have proved conclusively that an exposure of bituminous coal in heaps to the action of the weather for a period varying from two weeks to a year results in a large percentage of loss. This loss is in the nature of a slow or incomplete combustion; it is greater and more rapid in large heaps than in small, and is also favored by the greater or less state of subdivision of the coal, large fragments losing proportionally less than smaller ones. The loss varies from five to 25 per cent. Varrentrapp also gives the following test: "A quantity of pulverized coal (bituminous) was placed in a tight vessel, through which a current of air could be drawn. The vessel and air were brought to a temperature of 280 deg Fahr., and the air, after passing through the apparatus, was caused to bubble through certain chemical preparations which had the property of retaining and rendering visible carbonic acid. Under these circumstances the carbon of the coal was ultimately removed by the chemical solution of the air as carbonic acid, showing conclusively that a true combustion had taken place. This combustion is so complete that in three months nothing but ashes remain."

PRESERVING SCRAMBLED SURFACE.—The composition invented by Mr. G. F. Heyl, of Charlottenburg, consists of palm oil or oil of Senegal about 20 parts; coloring matter (hydrated protoxide of iron or chromate of lead and Prussian blue), 100 parts; varnish, 20; lac, in scales or flakes, 10; pyroligneous spirit of alcohol, 120; resinous gum or euphorbia, 50; chloride of mercury, 15; and arsenic 15=350 parts.

GOOD HEALTH.

The Increasing Use of Opium.

The custom house returns show that the quantity of opium annually imported into the United States is ten times greater than it was 30 years ago.

The quantity consumed for medicinal purposes has kept steady and regular pace with the growth of population, while the increase in the use of opium as a stimulant has been, and is, greatly in excess.

A well known physician reports that he had talked with several of the most intelligent apothecaries, who told him that "the use of opium had greatly increased, especially among women." The reason given was, that doctors were prescribing it more generally to their patients, and thus the habit was acquired.

In the *Edinburgh Medical Journal*, Dr. Minnet, lecturer on *materia medica* at Surgeon's hall, Edinburgh, sounds a note of warning, impelled thereto by three cases of opium eating, all starting from physicians' prescriptions, which came before him within a few weeks.

It becomes a very serious question, in the face of such facts, how best to guard against the indiscreet prescribing of opiates.

It would be well if opium were confined exclusively to the forms in which it is generally known; but, unfortunately it is not, and here lies the great danger. Under the treacherous guise of soothing syrups, elixirs, pain killers, nervous antidotes, and a long list of nostrums, it creates an appetite that by frequent indulgence almost inevitably ends in a confirmed habit. Still worse, it is prescribed by charlatans as a remedy for the cure of persons who are addicted to opium eating. There is no means of ascertaining the quantity of such nostrums disposed of yearly, and the extent to which opium is employed in their manufacture can only be conjectured. The fact that there are so-called remedies for the correction or cure of the habit affords a significant proof of the extent to which it prevails. One "remedy" for the eradication of this disease consisted of a clear solution of sulphate of morphia, colored and sweetened. No definite directions as to quantity were given, but a dose, containing about two grains of sulphate of morphia, was to be taken three times a day by the patient, "when suffering from depression and other symptoms."

The editor of the *Medical and Surgical Reporter*, in a recent article on this subject, remarks that there is probably no true hypnotic which is innocent. But, he adds, whatever is tried, opium and chloral should be religiously reserved for those cases of positive disease where sleep is indicated.

FOOD IN FEVER.—It has been found to be a successful method to freeze beef tae, and to administer it in limps to children or patients to snook: they will take it in this form rather than any other kind of food.

Poisoned Stockings.

The *Utica Observer* of March 4th gives the following particulars in regard to a little four year old boy of that city who suddenly became seriously ill. His physician, on observing his stockings, said at once that his sickness was probably due to his stockings, which were died brown, as the doctor thought by the use of picric acid. We quote the balance of the story as follows: Last Sunday the little fellow put on a pair of brown woolen stockings. Yesterday morning he was taken very ill. He commenced retching and vomiting, and a yellowish line commenced spreading all over his body. When Dr. Tefft was called the little fellow was suffering great pain. Dr. Tefft confesses that after an examination he was unable to see why the boy should be sick until his eyes fell on the boy's brown stockings, when the thought flashed over him that the newspapers were probably right, and that there was poison in them. He had them removed at once, and found that the boy's legs were fairly yellow. He then had the mother taste the stockings, and she declared they were very bitter. The mystery of the poor little fellow's illness was explained.

Dr. Tefft, on reading upon the subject of picric acid, found that it would produce the same symptoms as those exhibited by the boy. This morning the stockings were subjected to a thorough test. A piece was cut from one of them and placed in hot water for a moment. Then placing it between the teeth a very bitter taste was perceptible, so bitter that it irritated the end of the tongue. The pair of stockings was then placed in the water. On wringing them the water immediately became discolored, assuming a yellowish tinge which could not be mistaken. There is no doubt that the picric acid in the matter used to color the stockings produced the boy's sickness. At one time the little fellow was very near death, but he is now recovering. His yesterday's attack was his first serious illness, but it is noted that during the time he has worn the stockings he has been afflicted with diarrhea, headache and stomach ache.

The stockings were not a cheap pair. They were as nicely made and of as nice a shade as any. But their effects are dangerous. This picric acid is not used alone for purely brown stockings. It is also used to dye striped hose in which that color appears. But all brown stockings are not poisoned. Some of them are manufactured by honest dealers who disdain to make use of picric acid on account of its cheapness, because they know its deadly effects. There is one sure test to apply to detect its presence. Stockings dyed with it, placed between the teeth and against the tongue, impart a bitter taste which cannot be mistaken. Ladies or others about to purchase brown stockings would do well to apply this test before buying.

Keep the Feet Warm.

Never go to bed with cold feet. Never try to sleep without being perfectly certain that you will be able to keep them warm. To lie one night with cold feet gives such a strain to the system as will be felt seriously, perhaps ending in a fit of sickness.

Cold feet shows an unbalanced circulation. The very best thing to do is to warm them by exercise; if that be practicable. If not, try dipping them in hot and cold water, alternately, two or three times, and then using vigorous friction. If that does not warm them and keep them warm, heat them before the fire, drying them thoroughly, and then correct your habits, or improve your health, for be sure that one or the other is wrong, or perhaps both.

With all the rest, if you sleep on a hard bed, with cotton sheets, in a cold room, put on an extra covering over the feet. It is very convenient to have a "feet comforter," just wide enough to cover the top of the bed and about a yard deep. This may be made of some light material (perhaps the remains of some pretty dress), filled with cotton, like a "comforter," and tacked with some harmonious color. During the day this may be thrown over the foot-board, and spread over the bed at night. The advantage of this is to secure light covering for the feet without overburdening the remainder of the body.

If you use a hot brick or hot iron, put it in the bed a little beforehand, and then when retiring remove it. To sleep with the feet in contact with it has a tendency to make the feet tender.

But better than both of these, and to be used with or without them, is the foot blanket. This may be a square yard of domestic flannel, or two yards folded of Swiss flannel, or anything else you like that is warm enough, only have it nice and clean. Fold this around your feet and ankles before you put them into the bed. If not very cold, this will often warm them, especially if you have used friction; and if warm, it will prevent their becoming cold by contact with the cold sheets. It keeps the warm air around them. It does not make the feet tender, and it is far more convenient than the hot brick or soapstone. Try it, and if you are troubled with cold feet you will be likely to keep it by you hereafter. Whatever you use, always lie full length. To "curl up" hinders free circulation.—*Herald of Health*.

DOMESTIC ECONOMY.

Practical Hints for Inexperienced Housekeepers.

I can truly sympathize with all the army of women, wives of men of moderate means in our country, who have ever before them the problem to solve, "How can we spread a table three times a day with food palatable, nutritious and economical?"

Having had 25 years' experience in the various duties of the wife, mother, housekeeper, provider, cook, laundress and common seamstress, I shall be glad to say a word of encouragement and help to the young experimenter in all these complicated duties.

It is all very well for men to tell us that women cannot cook. When a man attempts cooking he makes a business of it; he spends years in learning the art; and then he must have an assistant to wait upon him; must have the best materials at hand and the proper utensils in work with; and, finally, he will expect to be well paid for his services. Don't condemn women as cooks until they have had a fair trial.

There are certain general principles in cooking, as in other arts, which should be learned, and the knowledge of these will make all details easy. We will make cake the especial theme of this paper.

The best flour should be used in cake making; indeed, there is no economy in using cheap flour for any purpose. The best sugar for all plain cake is the coffee A. It is cheaper and better than the granulated for common use. For making very delicate cakes the pulverized should be used, being careful to get pure sugar; it is apt to be adulterated greatly. Eggs should be kept in a cool place; they heat much better to be cold. Do not try to make cake with butter which is unfit for table use. It is not necessary to have the very best; good roll butter, having no bad taste, should be used. Recipes can often be changed without failure, if, for any reason, all the materials called for are not at hand. To venture upon this, however, you must not upon fixed principles. If you have but two eggs and the recipe calls for three, leave out a third of your butter and a little of your flour; the cake will be good. If your butter is short, leave out an egg.

It is often inconvenient to weigh all the ingredients; therefore, in giving recipes, I shall, if possible, give measures only. Roll sugar before measuring it; fill the cup even full, being careful not to pack the sugar. Flour should be sifted first and then placed lightly in the measure. Use for a measure a cup which will contain just one-half pint of water. For a measuring spoon use an ordinary silver plated spoon. A spoonful means even full—not heaped. Three teaspoons rounded full of baking powder is the general rule for a quart of flour; this must always be mixed very thoroughly with the flour, dry. If your recipe is an old one, and says cream of tartar and soda, you can generally substitute baking powder in its place. If you prefer to use the cream of tartar and soda, the soda must be dissolved in water and the cream of tartar mixed with the flour, dry. If your recipe says "sweet milk," use water in its place; the cake will be whiter and quite as good. To compound a nice cake two persons should, if possible, be engaged in the work; but we will suppose the young cook alone.

First see to your fire; this should be started at least an hour before the oven is needed, so that the bottom of the oven may be well heated and the heat steady. The baking is of the greatest importance, and should be carefully provided for. Read your recipe and place all the ingredients upon the table, or close at hand. Place your butter where it will soften, but not melt. Have the baking pans ready; place a piece of paper in the bottom and butter this and the sides of the pan carefully. The shape of the pan is immaterial, but it should be deep and not bright new tin. An earthen dish should be used for mixing cake. Now break the eggs, separating the whites from the yolks with great care; beat the yolks a few minutes, then the whites, till a fine, stiff froth is formed. Set the dish containing the whites in a cool place, and on no account disturb it until it is needed. Now put the butter and sugar together and beat or stir with the hand till the mass is light and soft, then add the yolks, spices, or flavorings; then the water, then the whites of the eggs and flour, alternating the flour and eggs, till all is well stirred together; remove the hand and put the cake in the pans with a spoon. If, for any reason, the oven is not quite ready the cake may wait, if placed in a cool place, till the oven is all ready. After it is placed in the oven it should not be moved without great care. Don't open the door for inspection too often.

If the oven should be too hot place a few nails under the pan and put a paper over the cake; remove a cover from the top of the stove, but do not open the oven door. The drafts, of course, must be closed; they should always, during the process of baking, be partially closed. To learn when the cake is done pierce the loaf with a broom straw; if the straw comes out dry and clean it is done. If you have any doubt, however, leave it in longer.

The above are general directions for all the ordinary kinds of cake. For fruit cake some special directions are needed. The fruit must be washed and dried; raisins stoned and chopped; flour dusted over the fruit and then put into the mixture, just before it is put into the pans.—*Cor. Chicago Tribune*.

MINING SCIENTIFIC PRESS

W. B. EWER..... SENIOR EDITOR.

DEWEY & CO., Publishers.

A. T. DEWEY, GEO. H. STONG,
W. B. EWER, JNO. L. BOONE

Office, No. 224 Sansome St., S. E. Corner
of California St., San Francisco.

Subscription and Advertising Rates:

ADVERTISING RATES.—1 week. 1 month. 3 months. 1 year.
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THE ORIGINAL ARTICLES in this paper are mostly set in solid type, giving in our columns one-third more reading than is contained in ordinary leaded matter.

Our latest forms go to press on Thursday evening.

San Francisco:

Saturday Morning, April 15, 1876.

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A NEW PACIFIC RAILROAD.—If the Black hills should prove a really productive mining region the result will undoubtedly be the construction of a new railroad from the Mississippi to the Pacific. Indeed, a charter has already been asked of Congress for such a road, under the title of the "Atlantic, Chicago, Black Hills and Pacific railroad company." The proposed route of this road west of Chicago deflects northerly through Southern Wisconsin, Northern Iowa to Yankton in Dakota, thence to the Black hills, and by very easy grades to the Yellowstone and Pacific, about midway between the present road and the proposed Northern Pacific. The eastern terminus will be Boeton, and the road will be managed in the interest of that city.

AMERICAN ENTERPRISE.—Mr. Robinson, an American of New York city, is now constructing a system of street railways for Kingston, Jamaica. With Meigs in Peru, Plomb in Mexico, and numberless others setting on foot railroads and other enterprises in Russia, Egypt and other countries, American enterprise seems to be revolutionizing the world.

THE CHEMISTS of New York and vicinity have organized as the American chemical society. Officers were to have been elected and a constitution adopted on the 20th of last month.

Depreciation of Silver.

The state of affairs now existing in this city in regard to our mixed coinage recalls the history of the introduction of the "greenback", issue. At the time when it was found necessary to use the latter means of extending the government credit, by forcing a loan upon its own citizens, there was no more doubt of its solvency and ultimate ability to meet its dues than there is now. As the question did not hinge on the good faith of those in power, as now, but on the mere financial stability of the nation, which was unquestioned even in the darkest period of the war, it would seem natural that people should have accepted the national promise to pay with a better grace, since there was no escape from the difficulty. Very possibly each person (or the great majority) individually would have been willing to take the notes of the nation freely, but from the fact that any form of money must be current with all other persons in order to have circulation, the tax was too great. We cannot now see that the greenback question was at that period any more difficult of solution than it is now, and we are forced to believe that loyal sentiment and unshaken faith in the credit of the country were then powers which obtain to a much smaller extent at present.

The silver problem is in some respects very similar to this, though the difference between paper pledges and a precious metal would seem to indicate the contrary. The manifest policy of this section of the country is to keep silver up to its proper position and not to depreciate it. While it is impossible of course to dream of seeing silver a monetary standard, as was formerly the case in some foreign countries, yet there is no just reason why it should be put from its proper place. The same difficulty of adjusting the coinage to a varying proportion of gold and silver is by no means a new one, and should create no panic. The fitness and weight of silver coins have again and again been forced to be changed, in this as in other countries, and the result can always be arrived at without any of the cumbersome and complicated devices which are now being so numerously proposed.

Here in San Francisco the rush of retail dealers to protect themselves against loss has caused a too sudden and disastrous revulsion, though the matter will work itself clear in time by the natural laws of trade. But it does seem too bad to see coin which is "legal tender" outrank better coin which is not so provided for. This is putting hard money into the same position as a forced and doubtful currency, and is an anomaly which cannot long exist. We hope that the people of this city, who are most nearly interested in the welfare of silver, will, as a matter of necessary policy, if not of simple fair dealing, unite in the effort to maintain confidence in that upon which we, of all others, are most dependent. Though the silver comes chiefly from Nevada, and altogether from outside the State, the ownership and control of the mines are centered here.

A. T. Stewart.

The overland dispatches on Monday morning brought news of the death of A. T. Stewart, of New York City. Perhaps no man in the whole country was better known. His name has been the synonyme for success. The story of his life, from the days when he was a poor emigrant boy to the years he has reigned a merchant prince, has awakened and moved many a young man to action. The incidents of his life are familiar to many, and yet they contain such proof of the earnestness of upright and honorable endeavor, that we are tempted to recite them again as his work has closed. He was born in Belfast, in 1808, and was liberally educated. He came to New York when he was 21 years of age and became a teacher. Soon afterwards his grandmother in Ireland died and left him a small legacy. Instead of bringing his little fortune back in gold he invested it in lace. With basket in hand he sought out the first families of the city, who could afford to buy his costly articles. His manners and modesty were such as to win for him the good will of some of his customers, who advised him to start a dry goods store. This advice he also followed and soon found a small store. The business prospered from the beginning, increasing so rapidly that Stewart found it necessary to obtain larger premises. He said at one time that he would not be satisfied until he increased his business so that his sales would amount to \$1,000,000 a month. By his strict integrity and straightforwardness his ambition was more than gratified, for in the year 1865 his sales amounted to \$55,000,000. Thus the basket peddler of lace went onward, by most careful attention to business, until he died possessed of a fortune of \$40,000,000. It was the result of honorable toil, sagacity and enterprise. The secret of his success was maintained throughout his whole career; it was—"Truth and Honesty."

DURING the month of March there were 7,133 arrivals in this city, and 3,310 departures. Of the arrivals, 2,799 were Chinese, making the total number of these people coming to our shores in three months, 5,400. The net gain in population for the quarter is 2,800 less than the corresponding period of 1875.

Gold and Silver Mining.

[By ALMARN B. PAUL.]

Of later years I have written more or less on the subject of gold mining, and endeavored to create a greater interest in this branch of our industries; but anything on the subject has been of little moment in the face of the grand hurrah for silver mining, which has carried the palm for capital for the past 15 years. The result of centering so much capital in one branch is before our business men every hour of the day, viz: 10 per cent. discount on silver coin, and from 15 to 20 per cent. on silver bullion.

If all the farmers of the State turn their attention to raising wheat, the market would soon become glutted, and wheat be at a discount, or what is the same thing, must lower its value. It is the same with silver now.

The "silver problem" is something to solve, says one. There is only one solution for it, and that is, we must produce more gold. A surplus of the precious metals, properly balanced, can but produce general good, in the increased value of everything but itself; but, while gold is the standard of value, it must be properly balanced by production, or discount of silver is the result. I need not say we must produce more gold; the silver evil, if so it can be considered, will bring forth its own remedy.

The discount on bullion is a fearful margin against silver mining, and at the same time is an equal percentage in favor of gold mining, and if the California press can appreciate the position of this metallic question, as it stands to-day, they will see an opening for giving renewed activity to every gold producing locality in this State, and in making California more attractive for capital than she has been for the past 15 years.

Gold mining, to-day, has 20 per cent. in its favor above what it had two years ago, and why should it not be more attractive? No business shows the same advance in its favor. California have given their energies and capital for the building up of Nevada and other silver producing localities; now suppose they throw some of their energies and their silver surplus into the building up of California through her gold mining interest.

In this question of silver vs. gold there is more than production to be cared for by the whole coast, and that is, that we do not let Congress out-legislate our business movements, and hence from us our gold currency, leaving us only the silver product for currency. This may seem at first blush to be impossible; but when the laws of trade, as relates to the precious metals, and especially as gold stands to-day, not only in the United States but Europe, it will be received as a proposition not to be lightly considered, but watched and acted upon. We must not be too much flattered by what is proposed in Congress to help us out on the silver question, but pay especial attention to keeping the gold ourselves, and discharging our silver products over the whole Union of States.

It would be a nice financial dodge of Congress and the financial heads of the Treasury and Eastern banks to force the discount on silver to a greenback basis and then give us, of this coast, the alternative of currency or silver, or both, while they quietly legislate and draw away our gold currency to pay for imports and duties, and on which they would make a handsome advance.

California has got to be watchful for maintaining gold as her currency, or we shall get beat in this metallic shuffle, even if Jones does lead the Senate on these questions—there are longer heads than his.

LANDS SOLD FOR DELINQUENT TAXES.—Governor Irwin signed the bill for the relief of persons whose lands were sold to the State for delinquent taxes under the act of 1874. The law now provides that where lands have become the property of the State under the delinquent tax law, the person originally owning the same, or his successor in interest, upon payment to the County Treasurer of the amount of the taxes, together with all the costs incurred, shall receive again a title to the land. An exception is made in this law that the parties shall not be entitled to recover land, originally owned by the State, where said lands were not paid for in full at the time of the delinquency.

IMPERIAL.—The articles of incorporation and also the certificate of consolidation of the Consolidated Imperial mining company were filed on the 12th inst. The consolidation includes the Imperial, Empire Mill, Consolidated Gold Hill, Eclipse, Winters and Plato Gold Hill Consolidated, Treach Gold Hill, Bacon and Bowers mining companies. The capital stock of the new company is \$50,000,000, divided into 500,000 shares of \$100 each. The purpose for which it is formed is to carry on the business of mining in all its departments, etc. The trustees are A. K. P. Harmon, J. D. Fry, A. C. Weller, J. H. Dohinson, Alphens Bull, William Norris and Joseph Sharon.

REDUCING FARES.—All the main line railroads throughout the United States, except the Union and Central Pacific, have agreed to sell tickets to Philadelphia and the Centennial at 25 per cent. discount.

THE MINERS of Staffordshire and several other mining districts of England and Wales are on a strike.

California Manufactures.

We were in one of our large city furniture stores the other day and as we passed from one floor to another, covered with the best specimens of the cabinet maker's art, we were assured repeatedly by the salesman: "There is not a piece of California made furniture in our whole establishment—every article is imported; we will not keep anything else."

We confess the words grated harshly on our ear. The furniture was most elegant and costly. The salesman doubtless emphasized the fact that it all came from the East, because he finds that our wealthy house furnishers prefer imported goods. Salesman are very acute men. They catch and employ in their trade what seems to be the disposition of the people. It is evidently "high-toned" to have one's house supplied with Eastern furniture, therefore every comer to the store is assured that the establishment will keep nothing made in this State.

This is not right. Our moneyed citizens, by frowning upon home manufacturers and paying much higher prices for imported articles, are crushing the industries of the State. They are throwing mud into the spring of their own prosperity. They are doing the State an injury by placing stumbling blocks in the way of its advancement. It will not do for our rich men to glory in our climate, in the richness of our mines or in the fertility of our fields, orchards and vineyards. It will not do to limit their patronage to the discoveries of nuggets and the production of mammoth vegetables and giant fruits. No; there must be patronage and encouragement bestowed upon our struggling home manufacturing industries.

There is now on the way to Philadelphia, a splendid display of California native woods for exhibition at the Centennial. The blocks are polished like mirrors. The richly grained and deeply colored woods will make Eastern workmen long for the chance to turn a tool into such fine material. Their ingenuity will sport in the fancy of what gems and glories of cabinets it could carve from these splendid forest growths. Suppose these workmen speak to their employers of such a thought. Laughing in his sleeve, the employing manufacturer will turn to the large figures of his California trade and say: "These trees would rot and you would starve, for rich Californians would not purchase your masterpieces. It is the fashion there to fill grand houses with my goods and I have their money here,—aha, here in my safe."

Californians, rich and prosperous, with princely mansions, overlooking bay and strait, proud in their eminence, you are doing your State an injury in this kneeling to a fancy which calls for Eastern goods. You are crippling home industry; you are forcing skilled laborers into tens when they ought to be counted by hundreds; you are placing limits to agricultural increase, because your policy cuts off markets to which it should minister. Your mansions are palaces, but—we had almost written, whited sepulchers, because the glory of the imported splendor which is in them is purchased at the cost of life to many home industries. You love your State, it has made you princes of wealth, and yet you disregard its needs in the disposition of your patronage. The burden of blame rests with you because you "set the style;" you dictate the disposition. The whole population mimics you. From the magnificence of your full furnishing, the fever dwindles according to each man's purse, until it ends in the imported footstool of the salaried clerk.

This is not right. Instead of hearing the hateful exclamation: "We keep nothing whatever of California manufacture," let the day speed when the proud manufacturer is able to say: "My workmen are the best in the world, everything we have is California manufacture."

MINING ACCIDENT.—The Virginia Chronicle of April 8th, says: Last Wednesday Edward Miller, a miner employed in the Consolidated Virginia mine, was severely injured by a blast while at work in the lower levels. He had charged and tamped the powder, and lit the fuse. Whether it was owing to the fuse being an exceedingly quick one, or the whole being improperly lamped is uncertain. He says that when he had lighted the fuse and retreated about four feet, he thought it had failed to ignite, and he turned to go back. Hardly had he done so when he changed his mind, but was too late. He had not turned his back before the charge exploded, fearfully mangle him.

THEY have been making it more than tropically warm for Col. Steinberger, at Samoa. Late advices received by the schooner *Ada May*, which arrived here on the 12th inst., give the impression that the downfall of the late Premier of Samoa was occasioned rather by the jealousy of certain foreign representatives than by any fault or misstep on the part of Steinberger. Considerable sympathy is felt for the ingenious and ambitious statesman of the cannibal islands in his adversity.

DISSENTING stockholders of the Leopard mining company have held a meeting, at which 11,850 shares were represented, and propose to investigate the affairs of the company and examine its books through a committee which has been appointed.

[Continued from page 241.]

within. This globe is suspended on hollow journals, and on its exterior surface are circular racks, B, which engage with the gear wheel, C, and the latter communicates with this hand wheel, L. By turning this hand wheel the globe is easily rotated. E is the furnace, the blast from which enters the globe, which is previously filled with ore and closed, through the water twee, F, which passes through one of the hollow journals. During the operation of roasting, the globe is constantly rotated, so that the ore within is kept in agitation, thus allowing the heat to pass through and act upon every part of its mass. The volatile products make their exit through the opposite journal, G, and entering the condenser, H, are condensed by a fine shower of water entering through the perforated diaphragm, I. In this way such materials are reduced so as to be easily removable; and at the same time, if precious metals be under treatment, such portions of the latter as would otherwise escape are caught and retained. From the condenser the blast passes, as shown, into the chimney.

It May Also be Used for Smelling Purposes.

The adaptation of the furnace for smelting purposes is easily understood from Fig. 3. The globe is of course held stationary during this operation; and the blast, entering by water tweers through both journals, passes down through the charge, is reflected up, and exits through the open man-hole above. The tweers can be continued downward and entirely around the bottom of the globe, if required. When the process is complete, the globe may be tipped to discharge its contents through the man-hole at J, or it may remain stationary and

The first one of these furnaces is being constructed by the Hartford Machine Co. for the new nickel smelting and refining works of Hartford, Conn. Four complete furnaces of like pattern are to be erected in these works. Patented April 6, 1875. For further information address the inventor, at 74 Asylum street, New Haven, Conn.

Gems and Precious Stones.

(Written for the Press by HENRY G. HANES.)

(Continued from last week.)

A.—Diamond, Jet and Cannel Coal.

Newton first suggested the probability of the diamond being combustible. He was led to this opinion by observing its power of refracting light so strongly. It was in 1675 that he advanced this theory. In 1694, the members of the Academy of Florence succeeded by means of powerful lenses in consuming diamonds. Lavoisier and others proved that the diamond was not evaporated, as supposed by the Académiciens, but was actually burned. Lavoisier found by his experiment that if air was excluded, no decomposition took place. He burned diamonds in close vessels with powerful burning glasses, and found that carbonic acid was produced, and discovered and announced the striking similarity between their nature and that of charcoal.

Sir George McKenzie found that they could be consumed in a common muffle. In 1797, Mr. Tennant made a decisive experiment by placing a diamond, the weight of which was noted, into a tube of gold with nitrate of potash. The tube was subjected to great heat, which was maintained some time. The diamond was

associated with a peculiar granular laminated quartz rock or sandstone, to which the name of itacolumite has been given. According to Dana it owes its lamination to a little tale or mica. This rock is found in Brazil, in the Urals, and in North Carolina and Georgia. The diamond is also found in a conglomerate called "casalho," which consists of rolled quartz pebbles in a ferruginous cement. Platinum, gold, rutile, zircon, quartz, feldspar, brookite, diaspore, magnetite and yttria minerals are almost always the associates of the diamond. Some platinum has been found in Georgia and North Carolina, where a few diamonds have been found.

Humboldt, in one of his works—"Essay on the Bearing of Rocks"—calls attention to the fact that gold, platinum and diamonds are associates in various parts of the globe; in some places, gold, platinum and palladium, in others, gold, platinum and diamonds. In the river Abote, in Brazil, diamonds are found with platinum; near Tejuca, with platinum and gold. These facts awakened in him the strongest hope of finding diamonds in the Ural, where the association of these metals is known to exist. When he arrived at any of the works, he caused the gold sands to be examined microscopically, and if gold and platinum were found, he directed the workmen to look carefully for diamonds. These examinations led to the discovery of microscopic crystals, previously unknown in the gold sands of the Ural—such crystals as in Brazil occurred with gold, platinum and diamonds.

The truth of Humboldt's theory as to the existence of diamonds in the gold sands of the Ural was proved by the subsequent discovery of a valuable stone by Paul Popoff, a boy of 14,

I believe Mr. Melville Attwood, of this city, was the first to predict the discovery of diamonds in California. I quote from a newspaper article written by him in 1854. He says: "I am anxious to call attention to the chance of finding diamonds in this country and the likelihood of their being overlooked. The rocks in which they occur are common in California. Itacolumite, a soft micaceous sandstone, always the associate of the diamond, is also found here. The gravel always found in the river washings so closely resembles the "casalho," or "diamond gravel" of Brazil, that I think it very probable that if proper search was made diamonds would be found." Mr. Attwood spent several years in the diamond districts of Brazil and is familiar with the subject of which he wrote.

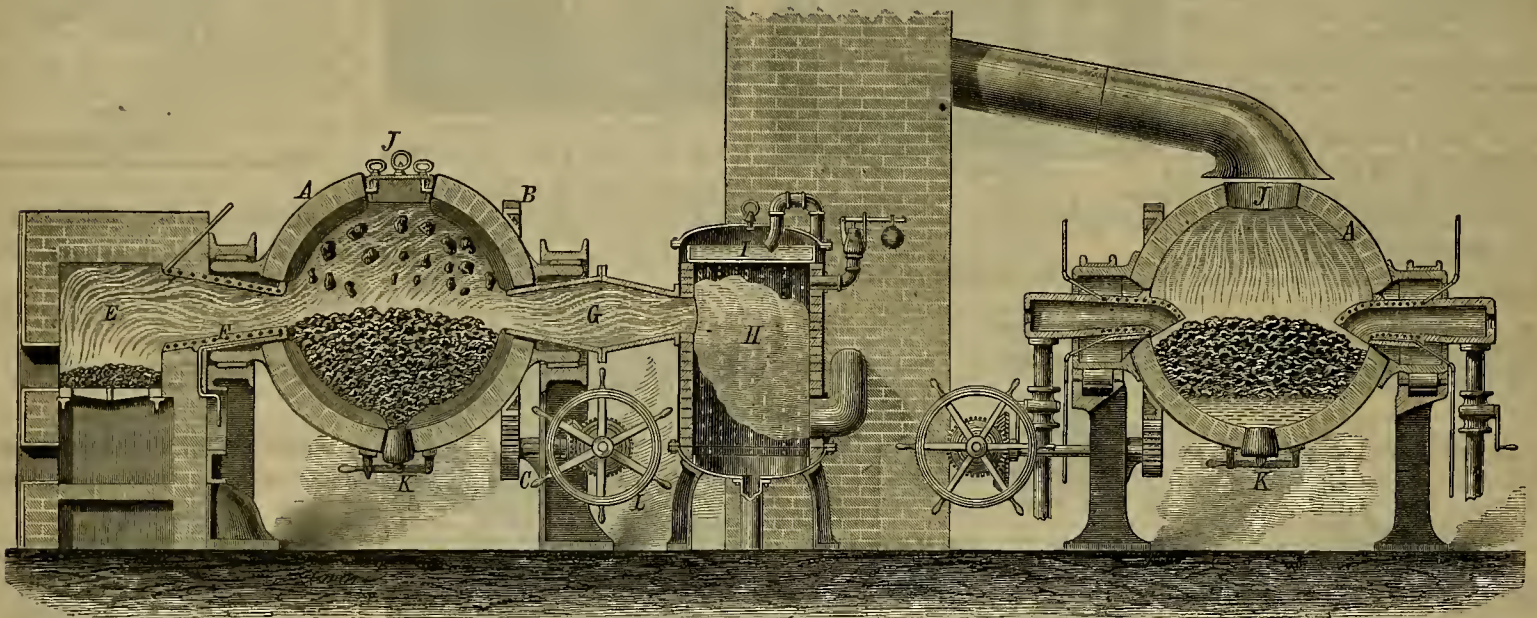
Among other localities of diamonds on the Pacific coast I may mention North San Juan, Nevada county; French Corral; Forest Hill, El Dorado county; Tuttle town, Amador county; Cherokee Flat, Butte county; Owyhee river, Idaho.

In 1850 Rev. Mr. Seymour saw a diamond in California with curved faces, the size of a pea. It was light straw colored, such as have since been found at Cherokee Flat.

(To be Continued.)

ASSAYING.—Either somebody has been sold, or else metallurgy has achieved a great triumph. Now the facts are these, at any rate, a correspondent at Littleton furnishes the points and vouchers for their accuracy: Some gentlemen interested in the new discoveries on Deer creek, in the vicinity of Littleton, had numerous specimens tested by assay at the school of mines in this city. In every instance

Fig. II.



MANES' NEW REVOLVING FURNACE FOR TREATING ORES, ETC.

the charge be removed through the vent at K.

General Advantages of the New Furnace.

Many of the ores hitherto found most difficult to handle, such as nickel, cobalt, antimony, arsenic, zinc, etc., can be safely worked in this furnace, as no injurious fumes, save such as pass through the condensers, can escape.

The following are a few of the many important purposes, besides the treating of gold and silver ores, that the Manes revolving furnace can be practically used for:

1st. Making wrought iron direct from the molten iron of the blast furnace or cupola. Also, malleable iron castings that require no annealing and can be worked under the hammer.

2d. To make several grades of steel without the aid of crucibles, thereby saving the great amount of labor and expense now required for this purpose.

3d. Refining, alloying and mixing metals of many kinds; also, oxidizing lead and zinc very rapidly and at little cost.

4th. Extracting mercury, (or quicksilver,) antimony, arsenic, zinc, bismuth, cobalt, nickel, lead, copper and all other metals from their ores.

5th. Making gas from coal or other materials; also, coke and coal for smelting purposes; and the washing of coal and other minerals to free them from sulphur and other impurities.

6th. Distilling and purifying mineral and other oils.

7th. Rendering or extracting lard, tallow, or any other fatty matter.

8th. Mixing mortar and concrete for building purposes, laying of roads, etc.

This furnace can be used for a great many other purposes too numerous to mention here. It is destined to come into very general use throughout the United States and foreign countries.

A great amount of labor is saved by its use in all the various purposes for which it is so well adapted, and it is without question one of the most complete labor-saving inventions that has ever been brought before the public.

oxidized at the expense of the nitre, and was consumed. The carbonic acid evolved was conducted into lime water, and the precipitated carbonate of lime weighed. It was found to be equivalent to carbon equal to the weight of the diamond consumed, proving it to be pure carbon.

The diamond may be burned in oxygen by suspending it in a glass globe filled with that gas. The stone is held suspended in a coil of fine platinum wire, which is made red hot by passing a current of electricity through it. The diamond soon begins to burn, and is wholly consumed. Lime water or baryta water is then shaken in the globe, when a precipitate of carbonate of lime or baryta is formed, which dissolves with effervescence in dilute acids.

The diamond can be fused by the action of a powerful galvanic battery. Experiments made with a view to prove this resulted in the fusion of six small diamonds in seven and one-half minutes. On exposure to the greatest heat they first changed to charcoal, then to graphite, after which they fused into globules. These experiments led to the conclusion that the diamond is not produced by the action of intense heat on vegetable or organic substances, which is a favorite theory.

The diamond crystallizes in the isometric system; sometimes crystals show the impression of other crystals upon their faces.

The Indian diamonds are generally octahedral. Those from Brazil are generally dodecahedrons.

The diamond is a non-conductor of electricity.

After a great fire in Hamburg, diamonds were sold for small sums which had turned black, but upon being repolished they became again as brilliant as ever.

Black diamonds are sometimes called "carbonate," or "carbonado." They are even harder than the crystallized stones. They are found in mummillay masses, sometimes 1,000 carats in weight.

But few diamonds can be used for cutting glass. The best glaziers' diamonds are worth \$50 per carat.

The diamond is generally, if not invariably,

to whom belongs the honor. It was first supposed to be a topaz, but a young Freiberg student, a Mr. Schmidt, who had the necessary instruments to test the hardness and specific gravity, identified it as a true diamond. Two others were soon afterwards found, the third being larger than both the others, followed by systematic search, which has since produced many valuable stones.

The same association of metals occurs in the northern counties of California, especially in the region drained by the Trinity river, in the sands of which microscopic diamonds are actually found. The same may be said of the vicinity of Coos Bay, in Oregon, and along the banks of Smith river, in Del Norte county. Miners throughout this whole region should search carefully for diamonds, and should send anything they find, which is likely to be such, to some competent and reliable mineralogist for identification. Diamonds may be looked for in flumes and in cleaning up sluices, with gold and platinum. An examination of the platinum sands of the Trinity river was made by Prof. F. Woehler, of Göttingen, who found the presence of diamonds in them. After removing gold, platinum, chromic iron, silica, ruthenium, etc., by the usual methods, he examined the residue microscopically, and observed colorless, transparent grains, which he presumed to be diamonds. Subsequent combustion in oxygen and precipitation of solution of baryta by the carbonic acid evolved, convinced him that the microscopic crystals were true diamonds.

This fact is an extremely important one to the inhabitants of the Pacific coast.

Diamonds Have Been Found

At Volcano, in Amador county, in a peculiar volcanic formation, described by Prof. Whitney as "ashes and pumice cemented and stratified by water." The crystals had the form of the icositetrahedron, with faces curved in the manner peculiar to the diamond. These facts and the discovery of Prof. Woehler lead to the assumption that diamonds are likely to be found with the gold of California and Oregon, and may become an important object of search.

the returns were encouraging to the mine owners. They must have doubted the genuineness of the mineral, or the metallurgists, or something, for as this correspondent admits, they bought a sycle stone of Jensen, Bliss & Co., of Denver, pulverized it and left it at the school of mines to be assayed. What representations accompanied the package of pulverized sycle stone, deponent, or correspondent sayeth not, but it was presumably represented to be specimen material from the new mines. However that may have been, the practical jokers got a certificate, No. 696, testifying that the stone yielded \$6 in gold and \$15.48 in silver! This isn't very strange, after all. Somebody—De in Swift or somebody else—says that sunbeams may be extracted from cnumbers, but the process is tedious. If an assayer can't extract a little gold and silver from a sycle stone, or, for that matter, from a brickbat, monkey-wrench, or buffalo chip, what is his calling worth to him?—*Denver News*.

A NEW MILL FOR TUSCARORA.—Mr. J. T. Babcock, of this city, is now arranging for the erection of a 20-stamp mill, which he will put up immediately on a mine in the Tuscarora mining district, about 30 miles this side of Cornucopia. The company engaged in this enterprise is known as the De Frees mining company. Their business office is at room No. 9, Halleck's building, in this city. Mr. Babcock is a stockholder in the mine, as well as the contractor for putting up the mill. The mine is a very promising one, and has been opened by a shaft 200 feet deep, with lateral drifts on the ledge, each way, a distance of 100 feet. About 350 tons of ore are already on the dump, the average assays of which indicate that the rock will pay, by milling, about \$100 to the ton—silver and gold. There is no base metal in the ore, which consists largely of chlorides. The ledge increases from three feet in width at the surface to eight at bottom of shaft. The contractor expects to have the mill running in about three months.

Nevada County Copper Mines.

Our county is known and acknowledged to be the richest gold mining section in the State. It also gives promise of excelling in the production of copper. That metal has been known to exist in the southern part of the county, near Spenceville, for a long time. In the winter of 1862-3, prospecting was commenced there, and a great excitement followed. Some of the ledges were sold for \$100 per foot. A large number of ledges were discovered, and a great deal of prospecting was done on them. For want of experience in working this kind of ore, or for the lack of the proper machinery, the mines did not pay and work was abandoned. Work on the ledge now owned by the San Francisco copper mining company, has, however, been going on for some years, and at the present time everything is looking favorably again, and the copper regions are beginning to attract the attention of capitalists and practical miners. We learn from I. J. Rolfe, who visited the mine this week, the following interesting particulars. The ledge has been sunk on to a depth of 150 feet. It is 80 feet in width, though of low grade ore, (averaging from eight to 12 per cent. copper) and can be worked at a very satisfactory profit. It costs one dollar per ton to mine and raise the rock to the surface, and six dollars covers the entire expense of mining and reducing the ore to bars ready for shipment. The ore is first roasted, and then put through the leaching process. There are four tons of pure metal now on hand ready for running into bars for shipment. The capacity of the works will be greatly enlarged this summer, so that a ton of copper can be obtained in 24 hours, after the improvements are completed. Mr. C. H. Aaron is the present superintendent of the mine. Bitner & Canfield have a mine about a mile and a half this side the San Francisco company's, which is smaller but much richer, and machinery having been put upon it the past year, it is now ready for work. The rock in this mine is crushed and then roasted by a method similar to the chlorination process. D. O. Mills & Co. also have a ledge near by, upon which machinery will be erected this season. The rock in this mine went from 20 to 25 per cent. pure copper, years ago. The ledge is about 12 feet thick. Machinery will be put up this season. Altogether the copper interests at Spenceville are looking up, and indications now point to very flourishing times in that section of the county from this time forth.—*Nevada Transcript.*

To ENCOURAGE EXTEMPORANEOUS SPEAKING, the seniors of Cornell university are now required to deliver short extemporaneous speeches on literary subjects in place of written essays.

IMMENSE deposits of copper ore have recently been discovered in Socorro county, New Mexico.

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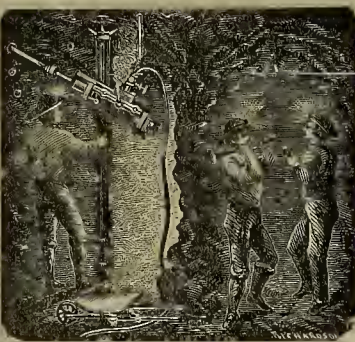
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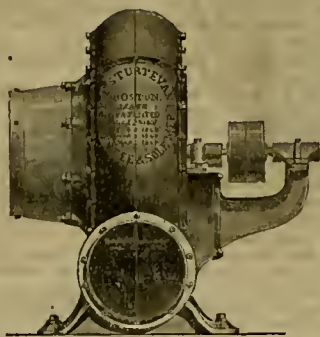
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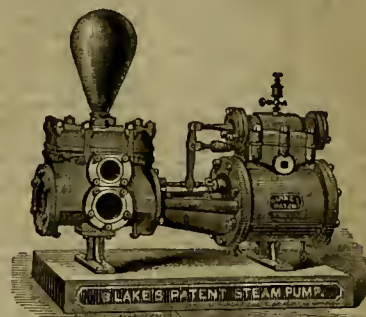
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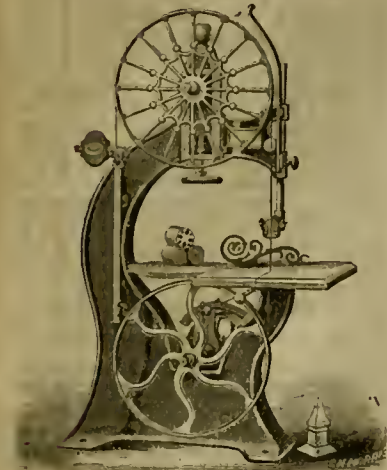
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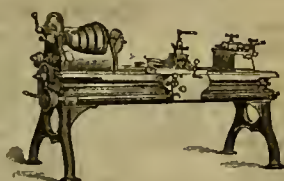
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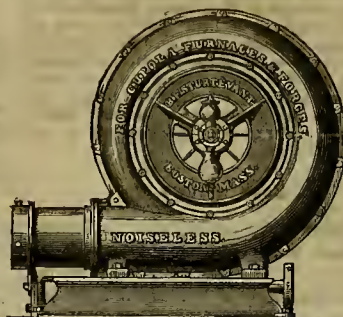
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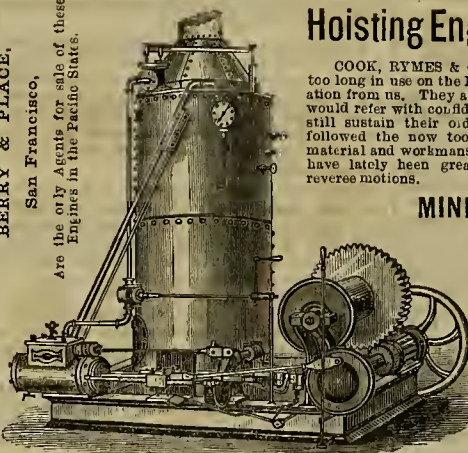
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OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

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DR. J. T. JOHNSON—California and Nevada.

Thanks for Prompt Attention.

STOCKTON, June 26, 1875.

Messrs. Dewey & Co., S. F.—
I have received the patent for my invention in wagon brakes, which you procured for me; patented May 11, 1875, No. 163,046. Thanks to you for your prompt attention to the case; you will hereafter be my attorneys in such cases. I recommend all inventors on the Pacific coast to give you a call, which I think they will never have any cause to regret. Very truly yours,
GEO. G. BOCKLAND
Stockton, Cal.

SANTA CLARA, CAL., April 6th, 1875.

Messrs. DEWEY & Co., Gents.—We have just received Patent No. 160,535, for J. T. Watkins & Co's Mammoth Road Grader, which was patented through your Agency. It is the newest and best that we have ever received. We feel proud of it and thankful to you for the care and attention that you have given it, and when we have anything to do in that line of business we will surely give you a call. Very respectfully,
J. T. WATKINS & Co.

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THOUGHTLESSNESS.—Persons sometimes return their paper, marked "stop this paper." Their name being pasted on the sheet they think that is all we need to be able to cross their names off. Now that is thoughtlessness. Your P. O. address is needed as much as your name. We have thousands of names arranged only according to locality. Our mailing clerk does not know where everybody lives.

BE MOORE PARTICULAR.—We can only make the changes requested by the following parties on our mailing list, when they, or some one else, send us their P. O. address. Otherwise we would have to look over from 7,000 to 10,000 names. Frank Becker, O. Seawell, L. Boyer, M. Lewis, F. Anson, and Antonio Byrnes. We also want the address of Wm. Buck.

SUBSCRIBERS are requested to examine the printed address on their papers. If mistakes occur at any time, please report them to this office. The last figures (at the extreme right) represent the year that your subscription is paid to. Next to these the day and month is represented. For instance, your subscription being paid to July 4th, 1876, it would be represented, viz: j1 4 76; or j175.

SUTTEE CREEK, February 26th, 1875.

Messrs. DEWEY & Co.—I have received my Letters Patent through your Agency. And, for your promptness, accept my thanks. Yours,
S. N. KNIGHT.

THE MINING AND SCIENTIFIC PRESS is one of the best papers published on this coast. It should be in the hands of every miner and mechanic in the State. The issue of last week contained an excellent article on the old product of this coast.—Oroville Mercury, Jan. 28.

UNKNOWN.—We have lately received cash at this office without due explanation; as follows: From Carson, Nev., \$4, by express.

The senders will please give full address, date of sending, etc.

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California Acclimatizing Society—Location

of principal place of business, San Francisco, Cal. Notice is hereby given, that at a meeting of the Board of Directors, held on the seventh day of April, 1876, an assessment (No. 7) of fifty (50) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, room 37, Nevada block, No. 309 Montgomery street, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the seventeenth day of May, 1876, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Wednesday, the seventh day of June, 1876, to pay the delinquent assessment, together with costs of advertisement and expenses of sale. By order of the Board of Directors.

Office, room 37, Nevada block, No. 309 Montgomery street, San Francisco, Cal.

The California Watch Company—Location

of principal place of business, No. 120 Sutter street, San Francisco, Cal.

Notice.—There are delinquent upon the following described stock, on account of assessment levied on the eighth day of March, 1876, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Am't.
M Godley, trustee.....	1	3,000	\$15,000 00
A Rammelsberg, trustee..	2	200	1,000 00
A Rammelsberg, trustee..	3	100	500 00
T M Antieil.....	4	10	50 00
A Rammelsberg, trustee..	5	1,130	5,650 00
Paul Cornell.....	13	10	50 00

And in accordance with law, and an order of the Board of Directors made on the eighth day of March, 1876, so many shares of each parcel of said stock as may be necessary, will be sold at public auction at the office of the company, on the first day of May, 1876, at the hour of twelve o'clock, P. M., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

H. T. GRAVES, Secretary. Office, No. 120 Sutter street, room 10, San Francisco, Cal.

Eureka Stone Manufacturing Company—

Location of principal place of business, city and county of San Francisco, State of California.

Notice is hereby given that at a meeting of the Board of Directors, held on the eighth day of March, 1876, an assessment (No. 4) of ten cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, No. 567 Market street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the twenty-fourth day of April, 1876, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on the eighth day of May, 1876, to pay the delinquent assessment together with costs of advertising and expenses of sale.

P. D. MOWELL, Secretary. Office, No. 567 Market street, San Francisco, Cal.

Klamath Quartz Mining Company—Location

of principal place of business, San Francisco, Cal. Location of works, Liberty township, Siskiyou county, Cal.

Notice.—There are delinquent upon the following described stock, on account of assessment levied on the second day of March, 1876, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
E A Richardson, trustee....	44	500	\$1500 00

And in accordance with law, and an order of the

Board of Directors, made on the second day of March, 1876, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the office of the company, room 8, No. 315 California street, San Francisco, Cal., on Tuesday, the second day of May, 1876, at the hour of one o'clock, P. M., of said day, to pay said delinquent assessments thereon, together with costs of advertising and expenses of the sale.

J. F. NESMITH, Secretary. Office, room 8, 315 California street, San Francisco, Cal.

The Golden Sun Gold Mining Company.

Location of principal place of business, San Francisco, Cal. Location of works, Forks of Butte Mining District, Butte county, Cal.

Notice.—There are delinquent upon the following described stock, on account of assessment (No. 1), levied on the first day of March, 1876, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Robt R Walker.....	1001	20	\$5 00
Robt R Walker.....	1002	20	5 00
Robt R Walker.....	1003	20	5 00
Robt R Walker.....	1004	20	5 00
Robt R Walker.....	1005	20	5 00
Robt R Walker.....	1006	10	2 50
Robt R Walker.....	1007	10	2 50
Robt R Walker.....	1008	10	2 50
Robt R Walker.....	1009	10	2 50
Robt R Walker.....	1010	10	2 50
Robt R Walker.....	1011	10	2 50
Robt R Walker.....	1012	10	2 50
Robt R Walker.....	1013	10	2 50
Robt R Walker.....	1014	10	2 50
Robt R Walker.....	1015	10	2 50
Robt R Walker.....	1016	5	1 25
Robt R Walker.....	1017	5	1 25
Robt R Walker.....	1018	5	1 25
Robt R Walker.....	1019	5	1 25
Robt R Walker.....	1020	5	1 25
Robt R Walker.....	1021	5	1 25
Robt R Walker.....	1022	5	1 25
Robt R Walker.....	1023	5	1 25
Robt R Walker.....	1024	5	1 25
Robt R Walker.....	1025	5	1 25
Benj F Josselyn.....	1052	50	12 50
Benj F Josselyn.....	1053	50	12 50
Benj F Josselyn.....	1054	50	12 50
Benj F Josselyn.....	1055	50	12 50
Benj F Josselyn.....	1056	43	10 75
E Pierce Hutchins.....	1074	500	125 00
E Pierce Hutchins.....	1075	100	25 00
E Pierce Hutchins.....	1076	100	25 00
E Pierce Hutchins.....	1077	100	25 00
E Pierce Hutchins.....	1078	100	25 00
E Pierce Hutchins.....	1079	100	25 00
E Pierce Hutchins.....	1080	100	25 00
E Pierce Hutchins.....	1081	100	25 00
E Pierce Hutchins.....	1082	100	25 00
E Pierce Hutchins.....	1083	100	25 00
E Pierce Hutchins.....	1084	30	7 50
E Pierce Hutchins.....	1085	28 3/4	7 08
Fred Franks, trustee.....	1091	1050 3/4	26 38
S H Sheplar, trustee.....	1092	100	25 00
S H Sheplar, trustee.....	1093	100	25 00
S H Sheplar, trustee.....	1094	100	25 00
S H Sheplar, trustee.....	1095	100	25 00
S H Sheplar, trustee.....	1096	110	27 50
S H Sheplar, trustee.....	1097	50	12 50
S H Sheplar, trustee.....	1098	50	12 50
S H Sheplar, trustee.....	1099	50	12 50
S H Sheplar, trustee.....	1100	50	12 50
S H Sheplar, trustee.....	1101	50	12 50
S H Sheplar, trustee.....	1102	50	12 50
S H Sheplar, trustee.....	1103	50	12 50
S H Sheplar, trustee.....	1104	50	12 50
S H Sheplar, trustee.....	1105	50	12 50
S H Sheplar, trustee.....	1106	10	2 50
S H Sheplar, trustee.....	1107	20	5 00
S H Sheplar, trustee.....	1108	20	5 00
S H Sheplar, trustee.....	1109	20	5 00
S H Sheplar, trustee.....	1110	20	5 00
S H Sheplar, trustee.....	1111	20	5 00
S H Sheplar, trustee.....	1112	10	2 50
S H Sheplar, trustee.....	1113	10	2 50
S H Sheplar, trustee.....	1114	10	2 50
S H Sheplar, trustee.....	1115	10	2 50
S H Sheplar, trustee.....	1116	10	2 50
S H Sheplar, trustee.....	1117	10	2 50
S H Sheplar, trustee.....	1118	10	2 50
S H Sheplar, trustee.....	1119	10	2 50
S H Sheplar, trustee.....	1120	5	1 25
S H Sheplar, trustee.....	1121	5	1 25
S H Sheplar, trustee.....	1122	5	1 25
S H Sheplar, trustee.....	1123	5	1 25
S H Sheplar, trustee.....	1124	8 3/4	2 09

And in accordance with law, and an order of the Board of Directors, made on the first day of March, 1876, so many shares of each parcel of said stock as may be necessary, will be sold at public auction on the 24th day of April, 1876, at the hour of two o'clock, P. M., at the office of the company, 702 Market street, room 2, San Francisco, Cal., to pay said delinquent assessments thereon, together with costs of advertising and expenses of sale.

JOS. PENTECOST, Secretary. Office, 702 Market street, San Francisco, Cal.

Josephine Gravel Mining Company—

Location of principal place of business, San Francisco, Cal.

Notice.—There are delinquent upon the following described stock, on account of assessment (No. 1) levied on the twenty-third day of February, 1876, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Certificate.	No. Shares.	Amount.

Improved and Successful Method of Sinking Shafts.

The *Colliery Guardian*, under date of London, England, November 19th, has the following:

In our last issue we stated that the directors of the Cannock and Huntington colliery company had decided to adopt the Chaudron process for the sinking of the pits at Huntington, and that some of the directors, accompanied by mining engineers, had visited Belgium and the North of France for the purpose of inspecting the pits sunk and sinking under the patent. The party first visited Briony, where a pit had been sunk, and was then being lined with tubbing. From thence they went to Marles, where one pit had been completed and another was in course of sinking; and from thence to Mons, where pits were being sunk. At all these places the visitors were impressed with the extreme simplicity of the work and the perfect character of the arrangements. The pits at Mons were very wet, the water lying within a yard of the surface.

Under M. Chaudron's process no water is drawn during the sinking, and if the sides do not stand, light lining tubes are put in. Very few hands, it is stated, are required in the work, eight or ten men being sufficient for all purposes, and the machinery is calculated to go through any ground, from running sand to the hardest rocks. All the sinkings visited were through chalk measures—occasionally through seams of solid flint, but the powerful machinery breaks through everything; and the spoon, which is estimated to hold from five to six tons, is let down, filled by a self-acting apparatus, drawn up, and emptied with as little trouble as an ordinary bucket. Twenty-eight pits have been sunk under this system at depths varying from 300 to 450 yards, including some requiring 250 yards of tubbing, and the system has not failed in a single instance. The tubbing is not in segments, as in England, but is cast in solid pieces of any diameter required, and five feet high, with flanges. Sheets of lead are passed between each casting, and each securely riveted to its neighbor.

After going down all the pits, which were sufficiently free of water, and carefully inspecting the tubbing, which was fixed or in course of fixing, the directors visited the foundry at Chateau Lineau, where the tubbing is made, and where they saw it cast, and tested with a strain of 420 pounds to the square inch. The result of the visit was to satisfy the whole of party that the sinking by the Chaudron process is more certain, speedy and economical than any plan now adopted in this country, and that the tubbing used by M. Chaudron is vastly superior, safer, and cheaper than that used here.

LEVI STRAUSS & CO.,

Patent Riveted

Clothing,

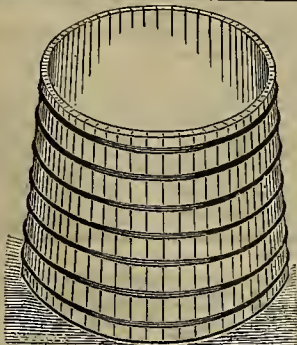
14 & 16 Battery St.,
San Francisco.



These goods are specially adapted for the use of FARMERS, MECHANICS, MINERS, and WORKING MEN in general. They are manufactured of the Best Material, and in a Superior Manner. A trial will convince everybody of this fact.

Patented May 12, 1873.
USE NO OTHER, AND INQUIRE FOR THESE GOODS ONLY.

eww-by



WATER TANKS of any capacity, made entirely by machinery. Material the best in use; construction not excelled. Attention, dispatch, satisfaction. Cost less than elsewhere.

WELLS, RUSSELL & CO.,
Mechanics' Mills, Cor. Mission & Fremont Streets
3v23-3m-sa

San Francisco Cordage Company.

Established 1856.
We have just added a large amount of new machinery of the latest and most improved kind, and are again prepared to fill orders for Rope of any special lengths and sizes. Constantly on hand a large stock of Manila Rope, oil sizes; Tarred Manila Rope; Hay Rope; Whale Line, etc., etc.

TUBES & CO.

611 and 613 Front street, San Francisco

Giant Powder.

Patented May 26, 1868.

THE ONLY SAFE BLASTING POWDER IN USE.

GIANT POWDER, NO. 1,

For hard and wet Rock, Iron, Copper, etc., and Submarine Blasting.

GIANT POWDER, NO. 2,

For medium and easy Rock, Lime, Marble, Sulphur, Coal, Pipe Clay and Gravel Bank Blasting, Wood, etc.

Its EXCLUSIVE use saves from 30 to 60 per cent. in expenses, besides doing the work in half the time required for black powder.

The only Blasting Powder used in Europe and the Eastern States.

BANDMANN, NIELSEN & CO.,

General Agents, No. 210 Front Street.

v22-3m16p

THORNE, DeHAVEN & CO.

21st Street, above Market,
PHILADELPHIA.

DRILLING MACHINES.

PORTABLE DRILLS. Driven by power in any direction, self-feed and convenient adjustment.

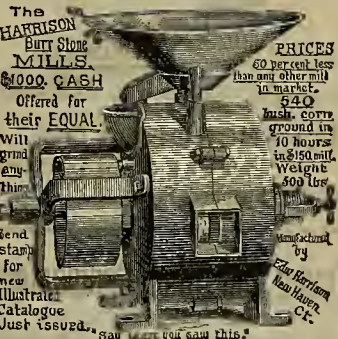
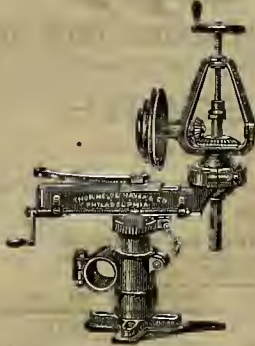
RADIAL DRILLS. Self-feed—large adjustable box table—separate base plate, every convenience.

VERTICAL DRILLS. Self-feeding—of new and improved designs.

MULTIPLE DRILLS. For boiler work, etc., 2 to 20 spindles, fed and returned by power or hand, together or separately.

HORIZONTAL BORING AND DRILLING MACHINES. For large pieces—with boring head, adjustable, vertically and horizontally.

SPECIAL DRILLS. For special work. Gun Blank Drills, Coal Drills, &c., built to order.



G. W. & C. A. LANE, Exeter, N. H., write, Dec. 13:

"We started the heavy 20-inch Corn Mill last Friday you sent to Baldwin & Tabor, Manchester, N. H. We ran it most all day, and ground 60 bushels corn per hour. The mill you sent us at Haverhill, Mass., for A. S. Hook, is doing wonderfully. It is grinding on an average 2,500 lbs. good meal per hour, and has ground 2,800 lbs. in an hour. It is driven by an engine with a 9-in. cylinder, and takes the place of a 30-in. mill of another kind that, when doing its best and loading the engine with all it could carry, only ground 1,500 lbs. per hour. If there is a mill built that can beat that we would be pleased to see it brought out."

Iron and Machine Works.

THOS. PENDERGAST.

HENRY S. SMITH.

ÆTNA IRON WORKS.

MANUFACTURERS OF

IRON CASTINGS

and MACHINERY,

OF ALL KINDS.

Fremont Street, bet. Howard and Folsom,

SAN FRANCISCO.

THE RISDON

Iron and Locomotive Works,

INCORPORATED.....APRIL 30, 1868.
CAPITAL.....\$1,000,000.

LOCATION OF WORKS:

Corner of Beale and Howard Streets,
SAN FRANCISCO.

Manufacturers of Steam Engines, Quartz and Flour Mill Machinery, Steam Boilers (Marine, Locomotive and Stationary), Marine Engines (High and Low Pressure). All kinds of light and heavy Castings at lowest prices. Casts and Tappets, with chilled faces, guaranteed 40 per cent. more durable than ordinary iron.

Directors:

Joseph Moore, Jesse Holladay, O. E. McLane,
Wm. Norris, Wm. H. Taylor, J. B. Haggin,
James D. Walker.

WM. H. TAYLOR.....President
JOSEPH MOORE.....Vice-President and Superintendent
LEWIS R. MEAD.....Secretary

24v17-17

Brass Foundry & Pump Factory.

A. J. SMITH, Plumber.

Sole Proprietor and Manufacturer of the Celebrated Hudson Force Pumps, Atwood & Bodwell Windmill Brass Pumps, Smith's Copper-Lined Pumps, Plumbers' Force Pumps.

Special attention paid to Breweries, Distillers, Beer and Hot Liquor Pumps and Wine Pumps. Particular attention paid to AIR PUMPS, also to

DIVERS' SUBMARINE PUMPS.

Artesian Well Pumps Made to Order.

Brass Castings Made to Order.

No. 222 FREMONT STREET, - - SAN FRANCISCO

WM. HAWKINS.

T. G. CANTRELL

HAWKINS & CANTRELL,

MACHINE WORKS,

210 & 212 Beale St.,

Near Howard, - - - SAN FRANCISCO.

MANUFACTURERS OF

Steam Engines and all kinds of Mill and Mining Machinery.

Also manufacture and keep constantly on hand a supply of our

Improved Portable Hoisting Engines,

From Ten (10) to Forty (40) Horse Power.

N. B.—Jobbing and Repairing done with Dispatch.

FULTON

Foundry and Iron Works.

HINCKLEY & CO.,

MANUFACTURERS OF

STEAM ENGINES,

Quartz, Flour and Saw Mills,

Hayes' Improved Steam Pump, Brodie's Improved Crusher, Mining Pumps, Amalgamators, and all kinds of Machinery.

N. E. corner of Tehama and Fremont streets, above Howard, San Francisco.

The Phelps' Manufacturing Co.,

MANUFACTURERS

OF ALL KINDS OF CAR WORK,

Machins Bolts, Bridge Bolts and Ship or Band Bolts.

13, 15 and 17 Drumm Street, San Francisco. 4v241y

Miners' Foundry and Machine Works,

CO-OPERATIVE,

First Street, bet. Howard and Folsom, San Francisco.

Machinery and Castings of all kinds.

PACIFIC

Rolling Mill Company,

SAN FRANCISCO, CAL.

Established for the Manufacture of

RAILROAD AND OTHER IRON

Every Variety of Shafting,

Embracing ALL SIZES of

Steamboat Shafts, Cranks, Pistons and Connecting Rods, Car and Locomotive Axles and Frames,

ALSO -

HAMMERED IRON

Of every description and size.

Orders addressed to PACIFIC ROLLING MILL COMPANY, P. O. Box 2032, San Francisco, Cal., will receive prompt attention.

The highest price paid for Scrap Iron.

OCCIDENTAL FOUNDRY,

137 and 139 First street, - San Francisco.

STEIGER & KERR,

IRON FOUNDERS.

Quicksilver Condensers and Furnace Castings.

Sole manufacturers of the Hepburn Roller Pan and Callahan Grate Bars, suitable for Burning Screenings.

Notice.—Particular attention paid to making Superior Shoes and Dies.

UNION IRON WORKS,

Sacramento.

ROOT, NEILSON & CO.,

MANUFACTURERS OF

STEAM ENGINES, BOILERS,

CROSS' PATENT BOILER FEEDER AND SEDIMENT COLLECTOR

Dunbar's Patent Self-Adjusting Steam Piston

PACKING, for new and old Cylinders.

And all kinds of Mining Machinery.

Front Street, between N and O streets,
SACRAMENTO CITY.

SHEET IRON PIPE.

THE

Risdon Iron and Locomotive Works

Corner Howard and Beale Streets,

Are prepared to make SHEET IRON and ASPHALTUM PIPE, of any size and for any pressure, and contract to lay the same where wanted, guaranteeing a perfect working pipe with the least amount of material.

Standard sizes of railroad Car Wheels, with special patterns for Mining Cars. These small wheels are made of the best Car Wheel Iron, properly chilled, and can be fitted up with the improved axle and bolt—introduced by this company, and guaranteed to outlast any other wheels made in this State.

All kinds of Machinery made and repaired.

24v22-3m JOSEPH MOORE, Superintendent.

Empire Foundry,

Nos. 137, 139 and 141 FREMONT STREET, SAN FRANCISCO

RICHARD SAVAGE, Proprietor.

Heavy and light Castings of every description. House Fronts, Mining and General Machinery estimated and constructed at shortest notice. On hand the celebrated Occident and French Kangas, Brick Caskets, Grates and Fenders, Road-Scrapers, Hydrants, Tugger rons, Ploughwork, Sash Weights, Ventilators, Dumb Bells, Gipsies, Ship Castings, SOIL PIPE of all sizes, Fittings and Cauldron Kettles in stock at Eastern rates. SHOES and DIES a specialty. Ornamental Fences in large variety. 4v30-1yr.

CALIFORNIA BRASS FOUNDRY,

No. 125 First Street, opposite Minna,
SAN FRANCISCO, CAL.

All kinds of Brass, Composition, Zinc, and Babbitt Metal Castings, Brass Ship Work of all kinds, Spikes, Sheathing Nails, Rudder Braces, Hinges, Ship and Steamboat Belts, and Gears of superior tone. All kinds of Cocks and Valves, Hydraulic Pipes and Nozzles, and Hose Couplings and Connections of all sizes and patterns. Furnished with dispatch. 3v-PRICES MODERATE. J. H. WEED. V. KINGWELL.

California Machine Works,

119 BEALE STREET, SAN FRANCISCO.

BIRCH, ARGALL & CO.,

Builders of QUARTZ, SAW AND FLOUR MILLS

Keating's Sack Printing Presses,

THE ECONOMY HYDRAULIC HOIST FOR STORES,
And General Machinists. 26v28-3m

THOMPSON BROTHERS,

EUREKA FOUNDRY,

120 and 131 Beale street, between Mission and Howard,
SAN FRANCISCO.

LIGHT AND HEAVY CASTINGS,

of every description, manufactured 2v16m

STEAM ENGINES AND BOILERS

Of all sizes—from 2 to 60-Horse power. Also, Quartz Mills, Mining Pumps, Hoisting Machinery, Shafting, Iron Tanks, etc. For sale at the lowest prices by

10v27tf J. HENDY, No. 32 Fremont Str.et.

McAFEE, SPIERS & CO.,

BOILER MAKERS

AND GENERAL MACHINISTS,

Howard st., between Fremont and Beale, San Francisco

MINING ENGINEER.

A Mining Engineer, with the best of best of references, thoroughly experienced in the opening and superintending of mines and mills, desires an engagement Address, "MINING ENGINEER," MINING AND SCIENTIFIC PRESS Office, San Francisco.

MINING MACHINERY DEPOT,

PARKE & LACY, 417 Market Street, S. F.

SOLE AGENTS FOR

Burleigh Air Compressors,

ROCK DRILLS and
Tunneling Machinery.

HASKINS'
ENGINES AND BOILERS,

(SEMI-PORTABLE)

1, 2, 4, 6, 8, 10 and 12 H. P.

WRIGHT'S

Bucket-Plunger Steam Pump.

COSMOPOLITAN EMERY

WHEELS AND STANDS.

Putnam Machine Company's

MACHINISTS' TOOLS and
Wood Working Machinery.

HEALDS & SISCO

Centrifugal Steam Pumps.

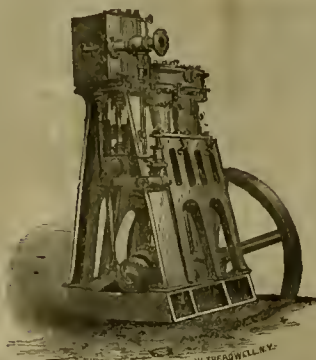
FARMER'S ELECTRIC MACHINE
FOR BLASTING AND HILL'S
EXPLODERS.

HASKINS' BLOWING ENGINES

For Mines.

Large Assortment of

MORSE TWIST DRILLS.



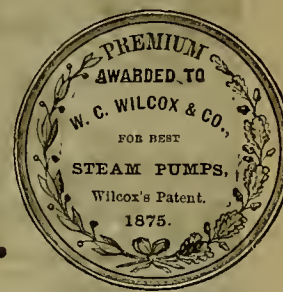
HASKINS' PORTABLE HOISTING ENGINES, constructed especially for economical use in mining districts, with Compressed Air or Steam, adapted to all classes of underground work and made throughout on the interchangeable plan, so that all parts can be duplicated when desired. Catalogues and Estimates given on application.



GOLD MEDAL

AWARDED TO

San Francisco Steam Pumps.



AFTER ONE OF THE

MOST THOROUGH TRIALS

Ever Had in the United States,

BETWEEN COMPETITORS

—OF—

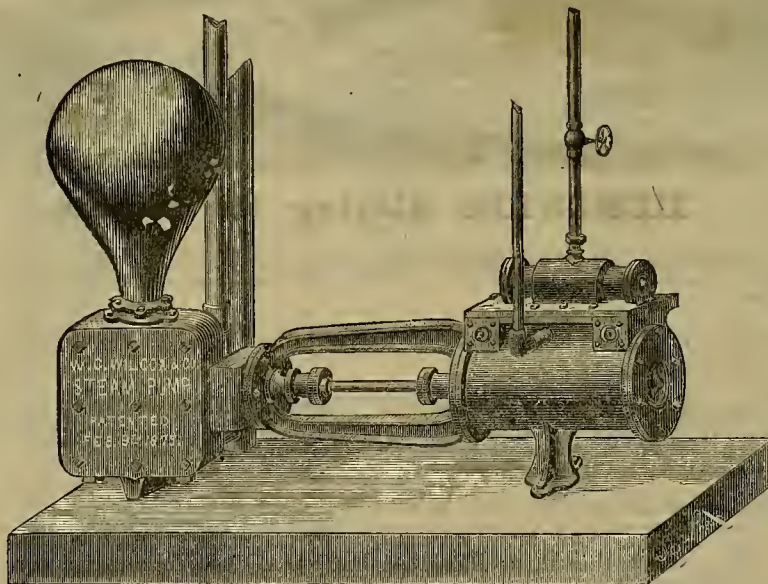
Best Established Reputation,

In which, at great expense, the different Steam Pumps were tried under every test known to experts, the Examining Committee of the Tenth Industrial Fair of the Mechanics' Institute have awarded to us their

GOLD MEDAL

—FOR—

Best Steam Pumps on Exhibition.



We are prepared to furnish PUMPS UNDER CONTRACT, guaranteeing their ability to perform any specific work for which steam pumps are adaptable, such as

RAISING WATER FROM MINES,

FOR WATER WORKS,

FEEDING BOILERS, RAISING WATER FROM WELLS; STEAMER AND SHIP PUMPS, ETC.

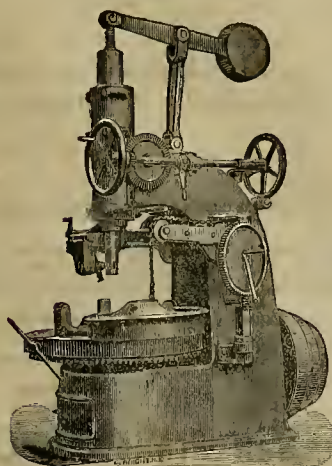
We would also call the attention of those interested, to our Direct Acting Deep-Well Pumps for raising water from

Any Desired Depth.

Also to our Especial Construction of Pumps FOR HANDLING QUICKSILVER or heavy liquids.

We claim that our Pumps are the best ever made in simplicity of construction, economical use of power, durability and perfect adaptability for general uses, and we ask all persons interested to investigate our title to this claim. Salesrooms at our Machine Shop, 111 and 116 BEALE STREET, SAN FRANCISCO.

W. C. WILCOX & CO., Proprietors.



No. 4 Car Wheel Borer,



We have the best and most complete assortment of

Machinists' Tools

In the Country, Comprising all those used in

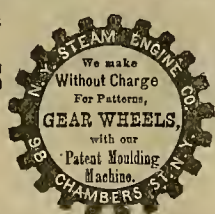
MACHINE, LOCOMOTIVE,

AND

R. R. REPAIR SHOPS.

For Photographs, Prices and Description, etc., address

NEW YORK STEAM ENGINE CO., 98 Chambers Street, New York.



TULLOCH'S AUTOMATIC ORE FEEDERS

Increase the Capacity of each Battery Two to Three Tons per day.

SAVE LABOR! SAVE MORE GOLD!
SAVE SHOES AND DIES.

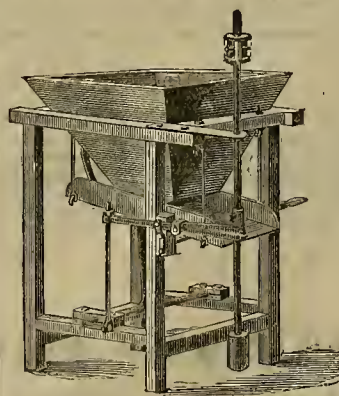
One Man Can Attend to a Hundred Stamps.

WILL FEED ANY KIND OF ORE, WET OR DRY.

ARE DIRECT ACTING. EACH MOTION SCRAPES A PORTION OF THE ORE INTO THE BATTERY. CAN REGULATE THE FEED. ARE SIMPLE AND DURABLE. ARE IN USE IN CALIFORNIA, NEVADA, IDAHO AND MEXICO. WARRANTED TO WORK.

F. OGDEN, Sole Agent,

417 Market Street, S. F.



HERCULES POWDER.



HERCULES Slaying the Giants.

[Hercules, the son of Jupiter and Almena, was descended directly from the Gods. He performed more wonderful deeds of strength than any of the heroes of old. On one occasion, he was sent by Eurystheus to execute a very great task, when he found himself opposed by several Giants, among whom were the powerful Giant Geryon, Eurytion, a Monster with three heads and six arms, and the two-headed dog, Orthus. All these he slew with his club. He then came to a high mountain, which, with one blow of his club, he broke from summit to base, and thereby made an entrance into the Mediterranean Sea, through the Rock of Gibraltar, the Straits of which are known to this day as the Pillars of Hercules.]

We wish to call the attention of Miners and others to a few points of the superiority of **Hercules Powder** over all other strong Explosives:

1. Its strength is greater than that of any other in use. The materials of which it consists are compounded upon strictly scientific principles, and are not a simple neutral absorbent employed that will hold a quantity of Nitro-glycerine. It is the opinion of the best chemists to whom the matter has been submitted that no mixture has been employed that so thoroughly promotes the whole tremendous force of the explosives employed, and at the same time neutralizes the offensive gases caused by the explosion. With this powder one-half the time is saved that is lost by using any other strong Powder, before you can resume work after a blast.

2. **UNIFORMITY.**—The materials of the mixture are chemically prepared, and therefore, great uniformity can always be depended upon and the best results obtained. This is a great advantage over any that varies in its strength as those must which are mixed with any natural earth.

3. **SAFETY.**—So perfect is this mixture that no accident can happen with it from premature or accidental explosion, if persons will half follow the rules laid down for its use. No Powder has ever been invented where so few accidents have happened with it in proportion to the quantities which have been used.

4. **CARTRIDGES.**—It is well known that nitro-glycerine has a tendency to decompose by volatilization. These are the "fumes" that are smelled on going into a close warm drift, or room where nitro-glycerine powders are stored. To prevent the escape of these "fumes" an almost hermetically sealed cartridge is employed, and so effectually is it, that some cartridges filled with Hercules were exposed to a blazing California sun for six months in summer, with no perceptible loss of strength. This is a great advantage over the open porous paper generally used for cartridges.

5. **ECONOMY.**—We believe that any miner who will take the trouble to investigate the matter will satisfy himself that full 15 per cent. is saved by using the HERCULES over any other strong Powder manufactured.

Query. Is this worth saving? We should think so. Try it. { Hercules X X No. 1, for extreme hard rock.
{ Hercules X X No. 2, for medium hard rock.

The GREAT SUCCESS of the HERCULES POWDER naturally aroused a strong opposition to its use, and litigation in defense of its rights become necessary. We would therefore call the attention of the public to the FINAL DECISION in the U. S. Circuit Court of the whole matter in favor of the California Powder Works, *which explains itself*:

DECISION OF THE COURT.

At a stated Term of the Circuit Court of the United States of America of the Ninth Judicial Circuit, within and for the District of California, held at the Court Room thereof, in the City and County of San Francisco, on Wednesday, the sixth day of October, A. D., 1875.

Present.—Honorable Stephen J. Field, Associate Justice of the U. S. Supreme Court, Honorable Lorenzo Sawyer, Circuit Judge.
THE GIANT POWDER COMPANY vs. THE CALIFORNIA POWDER WORKS, Et AL., In Equity, No. 1,233.—The Court having, on the 22d day of September, A. D., 1875, being a day in the July Term, A. D., 1875, of said Court, sustained the demurrer of the defendants to the complainant's amended Bill of Complaint herein, will leave to complainant to amend its said bill on or before the next succeeding rule day, and the said time granted complainant within which to amend its said bill having expired, and the default of said complainant to amend its said bill having been duly entered, and the Court having on the sixth day of October of the said term and year, on motion of C. R. Greathouse, Esq., Solicitor for defendants, M. A. Wheaton, Esq., Solicitor for complainant, being present, in open Court, and declining to amend his said bill of complaint, he having elected to abide by his said bill of complaint as filed in this cause, ordered that a decree be entered herein dismissing said bill.

Thereupon, upon consideration thereof, it is ordered, adjudged and decreed, that the complainant's said bill be, and the same hereby is dismissed, and that the said complainant pay the said defendants their costs in this behalf expended.

October 15th, 1875.

ENDORSED.—Filed and entered, October 18th, 1875.

(Signed) LORENZO SAWYER,
U. S. Circuit, Judge Ninth Circuit.

L. S. B. SAWYER, Clerk.
By J. F. O'BRIEN, Dep. Clerk.

Sold by **THE CALIFORNIA POWDER WORKS, 314 California Street, San Francisco, Cal.**

Also, all grades of Black Powder, Fuse, Shot, Caps, Etc.

MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO.,
Patent Solicitors.

SAN FRANCISCO, SATURDAY, APRIL 22, 1876.

VOLUME XXVII
Number 17.

The Industrial Depression.

The present industrial depression is not confined to the United States, and it has been suggested that the revulsion in this country is but a part of the general ebb in the world's affairs everywhere. Numerous and large failures are constantly being reported in England. A report was lately made of twenty English firms, in the cotton and iron trade, whose deficits ranged all the way from \$140,000, the lowest, to \$15,000,000, the highest. The fact that money can be borrowed in England at the low rate of three per cent. per annum, indicates that the trouble arises from a want of confidence and not a lack of money.

A recent issue of a late leading German journal complains of the unfavorable condition of trade in that country also, and attributes the result to the depression in the coal and iron trade, and the general increased cost of production, which prevents the accumulation of capital, and retards industrial development. France is, perhaps, the only European country which may at this time be considered in a prosperous condition.

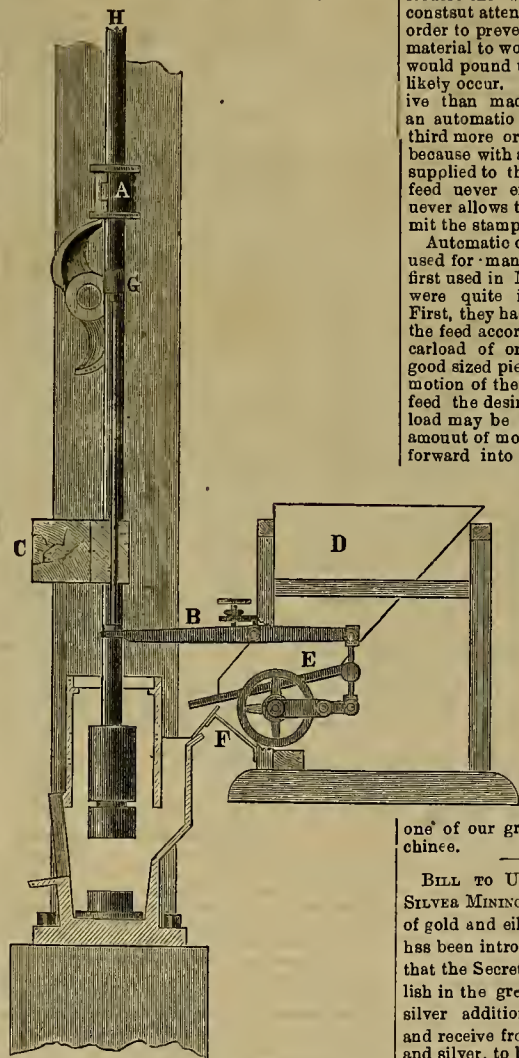
Probably the chief cause of the present general depression arises from the recent disturbances in international trade throughout the world, brought about by the late Franco-German war, and the unsettled labor condition and advanced price of coal in England. The disarrangement of the labor market and coal trade of England, and the persistent efforts of her workmen in opposition to the introduction of labor-saving machinery, has so advanced or kept up the cost of production that her foreign trade has greatly fallen off, in consequence of which many of her heavy manufacturers and merchants have been seriously crippled or forced into bankruptcy. The good credit and supposed ample facilities of reputed wealthy firms enabled them for a while to float immense debts and be bankrupt for years before the public became aware of the fact—but after awhile confidence became shaken, distrust arose, and the panic, which yet exists, followed. And now, although money is so abundant there as to be freely offered at three per cent. on approved security, so little confidence exists that business security cannot be found, and the money lies idle in the Bank of England, while the laborers throughout the realm are clamoring for work to keep themselves and families from starvation—and there is but small hope of any early change for the better.

The people of this country are also still suffering from the results of our late war. The immense national debt thereby heaped upon us, together with the almost universal demoralization of public officers, indirectly brought about by the war (for war always demoralizes), is now weighing us down with taxes to such an extent as to almost paralyze industry. To this may also be added a vicious system of currency, which, if not expressly designed, is at least admirably calculated for and industriously applied to making the rich richer and the poor poorer. With all these disadvantages, however, we are on the sure road to wealth and prosperity. Our lands are productive beyond measure; our manufactures are rapidly increasing and finding their way more and more into foreign markets; our mines of precious metals are astonishing ourselves and the world with their extraordinary riches; our exports of merchandise and agricultural products are increasing and our imports decreasing so rapidly that, to all appearances, the balance of trade will soon be in our favor; and now a thorough reform in national and financial relations, which will give us such an honest and economical administration of government as will reduce taxation to its proper standard, and furnish a currency in the interest of the people instead of money lenders, is all that is needed to dispel hard times from our midst and place this people directly on the high road to national and individual prosperity. The power to bring about this result the people have in their own hands, and the signs of the times fully indicate a determination on their part to use it, and that, too, truly and effectually.

With a proper administration of our governmental and monetary affairs, this country may soon become the workshop and granary of the world, and the almost sole producer of the precious metals.

Ore Feeders.

We don't presume that all of our readers are miners, and many that are not do not fully understand what is meant when we refer to various parts of mining machinery by their miners' names. For instance, how many persons would be puzzled if they were asked to define a winze, a horse, a buddle and numerous other crooked terms used by miners to represent miners' notions. We have headed this article "Ore Feeders," and lest some unsophisticated reader should infer that we refer to a class of "ani-



AUTOMATIC ORE FEEDER.

mata" that live and fatten on indigestible ore, we will explain that an ore feeder is a machine that is placed in front of a battery, and that it consists of a hopper, marked D, into which the ore is poured after it has been reduced to the desired size by passing through a rock breaker or crusher. Below this hopper is an inclined shute or table, E, upon which the ore will fall as it passes through the lower opening in the hopper. This table or shute is so arranged that when it is rotated or agitated the ore will be caused to drop from its edge into the battery under the stamps, as will be readily understood from the engraving. The amount of ore thus supplied to the battery is regulated by the stamps themselves, by means of a lever, B, one end of which is either attached to the shute or to a device which rotates the table, E, while its

opposite end extends out beside the stamp stem, H, the fulcrum being at or near the middle of the lever. A collar or tappet on the stamp stem is arranged to strike the end of this lever when the stamp drops close to the die, but when a sufficient quantity of ore is under the stamp to prevent the collar or tappet from dropping low enough to strike the end of the lever, the table is not agitated and the feed of the ore ceases. It will thus be seen that the machine is automatic in its action; that is, the requirement of the stamps is indicated by the amount of drop or force of the blow delivered by the tappet, and the amount of drop is regulated by the requirement of the stamps.

Before the introduction of automatic ore feeders the work was done by hand and the constant attendance of a man was required in order to prevent the stamps from getting out of material to work upon, otherwise the stamp would pound upon the die and damage would likely occur. Hand feeding, also, is less effective than machine feeding. A battery fed by an automatic ore feeder will crush fully one-third more ore in a day than one fed by hand, because with an automatic feeder the quantity supplied to the stamps is uniform—that is, the feed never exceeds the proper bounds, and never allows the supply to get so low as to permit the stamp and die to come together.

Automatic ore feeders have been known and used for many years. We believe they were first used in Mexico, but the early ore feeders were quite ineffectual for several reasons. First, they had no arrangement for regulating the feed according to the quality of ore. One carload of ore may be dry and composed of good sized pieces; this ore will feed freely, less motion of the shute or table being required to feed the desired quantity; while the next carload may be fine and wet, so that a greater amount of motion is required to force the ore forward into the battery. Secondly, the motion given to the shute was a shaking motion, which was not certain in its action, and sticky material would not leave the shute. Subsequent improvements, however, have provided a regulating device by which the motion of the feeding table or platform can be regulated by simply turning a screw without stopping the action of the feeder. Positive movements have been supplied for operating the table or shute. Sorapere are used for ensuring a positive feed when wet and sticky ore is to be fed, and taking it altogether, as the machine is now manufactured and used, it is

one of our great labor-saving and useful machines.

BILL TO UTILIZE PRODUCTS OF GOLD AND SILVER MINING.—A bill to utilize the products of gold and silver mining in the United States has been introduced by Mr. Banks; it provides that the Secretary of the Treasury shall establish in the great mining districts of gold and silver additional depositories and refineries, and receive from the miners and owners gold and silver, to be coined upon certificate of the Government assayer, and issue certificates of deposit therefor, payable to bearer and for such sums as the depositors may desire, and, when issued for more than \$500 in one certificate, to be made payable to order. Each certificate shall promise a return of the amount of gold and silver called for by the certificate, and shall be a legal tender in all transactions. The Government is to be liable for the safe keeping of gold and silver, and may become the owner thereof by obtaining certificates through purchase or redemption. The Secretary is also authorized to issue similar full value certificates on coin that is now, or may hereafter be, in the Treasury, reserving coin for redemption.

INVESTIGATIONS and compiled statistics show that only one railroad passenger in 7,000, 000 is killed, and only one to 1,500,000 is even so much as bruised. In the year 1874 only one person was killed on all the Massachusetts railroads, while 76 were killed by accidents in the city of Boston.

Explosions in Mines.

The terrible destruction of human life from explosions in coal mines has long been a matter of serious consideration, and various have been the appliances and precautions devised by scientific men to avoid or materially reduce the danger. The Davy lamp seems to afford very little protection, either from defects in its construction or carelessness in its management. Indeed, so unsafe or uncertain has it become that it has been seriously proposed to lay aside that lamp altogether, and go back to the use of naked lights as the less dangerous of the two.

This matter came up for discussion at a recent meeting of the French Academy of Sciences, at which meeting M. Faye read a paper in which he advocated the abolition of the Davy lamp and the substitution of uncovered oil lamps placed about 10 yards apart in the mines. By this means, he said, the explosive gases would be consumed gradually as they escaped, and without accident, just as a ton of powder would be got rid of harmlessly if exploded in pieces. In the discussion which ensued it was demonstrated that this project would not answer, as the deleterious gases, when escaping, would remain inert until they bore an explosive proportion, about eight per cent. to the atmosphere, in the same way as an ordinary gas jet if turned on in a room containing a light would not inflame, though an explosion would ensue when a sufficient quantity of the gas had mingled with the air.

M. Faye was ultimately induced to withdraw his paper. The members present generally testified to the efficiency of the Davy lamps if kept in good repair and used by careful miners; but, on the ground that these desiderata appeared to be unattainable, M. Boussingault gave his entire support to their abolition and the substitution of electrical lighting apparatus, as a means of reducing the excessive cost of the latter could be devised. In the course of the discussion reference was made to the method established with respect to the Davy lamp by M. Boussingault in the petroleum mines in Alsace. Before the miners enter these mines the efficiency of their lamps is tested by plunging them into a cylinder containing a petroleum vapor. The slightest flaw is detected.

AN INTERESTING DISCOVERY.—We see it stated that Prof. Silliman, of New Haven, has discovered a method of producing a peculiar physical change in German silver, Britannia metal, pewter and other like alloys, by a process which he has patented. This discovery seems to have been a natural outgrowth of the late discovery in tempering glass, which produces such an important and wonderful change in the constitution of that material. Prof. Silliman's discovery consists in exposing articles formed of any of the alloys above mentioned to the action of a regulated temperature, somewhat short of their melting point, in a bath of oil. After a little time, instead of giving out when struck a dead sound, they appear to have acquired the property of ringing clearly. This is no doubt due to a re-arrangement of the molecules of the alloy, which assume more of a crystalline structure than that which the alloy previously possessed. The discovery will no doubt find some valuable applications in the arts.

PATENT LITIGATION IN ENGLAND AND AMERICA.—Under the present patent law of Great Britain, patents are granted for every new idea for which any person may chance to apply and no questions asked as to who is the inventor. No official examination is had. To the average American mind it would appear that such a course would lead to endless litigation; but such is far from being the case, as from a recent report it appears that an average only of eight patent cases per annum are litigated in Great Britain, while the average in this country exceeds 10,000. It would appear from this fact that excessive legislation is a great stimulus to litigation.

New machines for the preparation of flax fiber have been invented, which it is claimed promise to produce as great a revolution in the flax production as was produced by the Jacquard loom and the cotton gin.

CORRESPONDENCE.

A Winter Visit to Mammoth Cave.

EDITORS PRESS:—Some account of a visit to Mammoth Cave in winter may be acceptable to your readers. By the railroad between Nashville and Louisville you reach Cave City, a station nine miles from this greatest of caverns. The travels by which life's work tosses us to and fro in diverse places, having carried the writer by this route three times without his taking the leisure to examine that really great "wonder of the world," he concluded it would be almost inextensible to lose the fourth opportunity, so he devoted a day, the 5th of January, in this Centennial year, to the long wished for visit. During the months when tourists usually go to see this cave, a brisk drive of two hours will easily take you there, over the limestone hills which abound in all this part of "Old Kentucky." But over the muddy roads of winter you do well to reach it in less than three hours. Almost the entire road is through a rolling country among miniature mountains, which in places must reach a height of 300 or 400 feet above the general level.

Well Improved and Fertile Farms

Are dotted quite thickly along the road, as many as ten being sometimes in sight in one small valley between the hills. A farmer of course surveys these with interest, as he hurries by. He observes that almost every farmhouse is constructed of neatly hewn oak logs of small size, usually eight or ten inches in diameter, and so nicely "chinked" and plastered as to make the walls outside even smoother than a weather-boarded house. The weatherboarding, when seen here, and nearly all the planks, indeed, are poplar. You must know that not a single pine is seen in all this region of oaks, and chestnuts and elms and poplars. What pine timber you see is brought from a great distance, and is more expensive than the native woods. Still, the hills are heavily timbered, though the trees are comparatively small. A few dwarfish cedars occasionally appear.

In several fields the corn had not yet been gathered. What wheat I saw was looking well. Here they sow both winter and spring wheat. This reminds me that in my letter written you while passing through Nebraska, your printer's "devil," or some kinsman of his, made me say that they sow no grain but rye in Nebraska. Now what I said, or meant to say, was that they sowed no grain but rye in winter there. Other small grains they sow in spring. But no! for

Mammoth Cave.

During the last two miles before you reach the Cave hotel you observe that no more farms appear. The forest is as wild as in the days when Daniel Boone first explored these regions, except that here and there some firewood has been cut. On inquiry, you learn that 2,000 acres were long since bought up around the mouth of the cave by its owners to prevent the possibility of having another entrance found, and a competition established in dealing out this wonder of Dame Nature. That there is good reason for this precaution is evident from the well known fact that the opening through which a white man first entered and discovered it in 1809, following to it a bear that he was hunting, is a quarter of a mile from its present large and convenient mouth. This first entrance is now closed.

To enter the cave you follow your guide down a winding pathway into a deep ravine thickly studded with forest trees, the natural growth, along its sides and bottom. At last you face the rocky chasm, and to reach the level of its floor, you descend to the right some rough steps made in its limestone formation. Just to your left, as you approach the dark month, a tiny stream of pure water dashes over the low cliff, and loses itself in crevices which lead it underground by some unknown channel. Just inside

The Entrance,

And protected from the breeze of the outside world, your guide lights his lard-oil lamps. These are suspended by a simple wire frame, but are not "safety lamps," for no explosive gas has ever been found in any of the hundred miles or so of avenues, chambers, domes, pits, etc., in Mammoth Cave.

Properly equipped with four of these, the guide and I made our lonely entrance. In summer he frequently leads in a dozen, or occasionally fifty tourists at a time. The one with me, a faithful negro man, kindly remembered by all who meet him, has performed this duty for the past 37 years. Soon our way was stopped by a solid stone wall and door of iron bars securely locked. Through this door a slight current of air was passing steadily from the cave. The average temperature of the air inside is 59 deg. Fah. Consequently, in warm weather the current flows out, in cold weather it flows in. The guide looked the door again when we entered, and we were at once, but for our lamps, in that darkness most profound, which continues through all this somber, weird journey, in regions that seem like the realm of the dead, a symbolic Hades truly.

For a short distance the flat limestone roof is but a few feet above your head, though the width of your pathway is full 20 feet. Soon the height of the roof increases, until it is supposed to be in places full 60 feet above you. First, your attention is attracted by a faint chattering sound, which you find comes from thousands of common bats, that are seen clinging singly or in large patches to the walls. In the first half mile of the cave myriads of them make their winter quarters. Their chirping is the only sound you hear during the whole route, except your own voices, or the dripping of water in the vicinity of Lethe, the Styx and Echo river. Indeed, these bats are the only inhabitants of the cave, except a few pale-colored crickets, near the two springs, a few rats of a dingy white color, and the curious blind fish of Echo river. Of the latter I examined a living one, in a glass jar, at the Cave hotel. It was of a light flesh color, and so translucent that you could easily distinguish its backbone, and some of its vitals. Yet it was in a plump, healthy condition, although I was assured that it had been three months in the jar, without any food. They merely change the water daily. The specimen examined was five and a half inches long.

About a quarter of a mile from the mouth of the cavern you find

Several Niter Vats.

Which were used to manufacture saltpeter for our powder mills during the war of 1812. Many small oak logs still remain which were bored and used as pipes to convey water to and from the vats. Though they have been lying in the cave for more than 60 years they are still in a remarkable state of preservation, some being as sound, to all appearances, as when they were placed there. For a quarter of a mile you find a line of these oak pipes, and then come to a second set of tanks. Along this distance you trace distinctly the road used for ox carts to pass between the tanks, and you can distinctly see at several points the old ruts of the wheels and the tracks of the oxen. The floor of the cave was then moist and muddy—now it is very dry and hard. You pass through the Dome, and reaching a large mass of rock, called, from its shape, "The Giant's Coffin," you leave the main route and pass for a mile or more through a long avenue, where there are some large

Stalactites and Columns.

In one of the latter, called the "Arm Chair," you can have a short rest, if desired, before going on to "Lover's Leap" and other noted features. The ceiling of this avenue, being rather low, is filled with the names of visitors, the earliest dates being in 1816, only a few years after the cave was discovered. These names were made by placing the candles, then used by guides and visitors, on poles, and holding them near enough to the ceiling to trace the letters with soot from the flame. One is struck with the fact that among the thousands of names found recorded there, you see none belonging to persons who ever became distinguished. Is not this almost invariably the case with those whose chief ambition seems to be to leave their names in places of public resort?

Passing Lover's Leap you descend gradually into a narrow and most dismal chasm, and visit a number of interesting objects. Among these is the celebrated "Bottomless Pit," a very deep cavity, of which you can just manage to see the bottom from the light of a burning taper dropped into it. The taper used by the guide to give a brighter light in such places is very simple. It consists of wide strips of coarse brown paper about a foot long, folded till about an inch in width, and saturated with oil. They make a sufficiently good light.

"Goblin's Dome,"

Examined by aid of these tapers, is one of the most impressive sights there. It is a very high and deep fissure, some 50 feet wide, into which you look through a small window-like opening in the main avenue. Being of about the same size all the way, it is supposed to be at least 150 feet from the point of observation to the bottom, and quite the same distance to the top. But when one comes to recall the peculiar and impressive features of this wonderful "hole in the ground," nothing looms up more vividly in tender recollection than "Fat Man's Misery" and the "Corkscrew." Through both of these your correspondent "worked his passage." How narrow! how tortuous! how low! what a squeeze it was! It was close, warm work. Once will do, Mr. Editor, I never knew before that any such places existed in Mammoth Cave. So let me caution any of our fleshy friends, e. g., A., of Santa Barbara, or E. C., of Temescal, if ever they visit the cave, to find out where those narrow defiles are, and let them alone. If they venture in, it might prove the death of them. If one of them got fastened there the guide could never get him out again in the world. I saw how it was myself. None of us would want to find a tomb already hewn out in these catacombs of nature. It requires no small amount of dodging, squeezing and crawling to get through "Fat Man's Misery," and the "Corkscrew" alive.

In a beautiful dome called

"Star Chamber,"

Because when the lights are partially hidden behind a huge rock, myriads of stars seem to glisten in the dark arched roof, the guide is in the habit of removing the lights entirely by taking them through a side avenue leading from one end of the chamber to the other. He does this that you may realize the intensity of darkness

which reigns supreme in man's absence.

Oh! darkness and solitude most profound!

DeQuincy says there is no solitude equal to that of being alone in a large city. Such solitude is great indeed; but pardon me, if inclined to think, from experience, that the profound loneliness felt when by one's self in Mammoth Cave without a light, far surpasses DeQuincy's picture of solitude. Being lost in the cave for a short time has been known to craze people. Who can wonder at it?

Before reaching "Star Chamber," you find in the main avenue two

Small Stone Houses,

The only remaining ones of eight erected there in 1842 to receive consumptive patients, according to a queer idea of some physician who thought the dry air of the cave would benefit them. For three weary months, shut out from healthful light, 12 consumptives lived there with four nurses, until one of the patients died. Suddenly that mode of treatment became unpopular, and the survivors left.

Passing the river Styx on its natural bridge, and visiting Lethe, we found the water and boats in such condition that it was deemed best not to try to reach Echo river. Indeed, just a week before the back water from Green river had been 20 feet deep over much of the muddy, treacherous path by which we reached this modern

"Stream of Oblivion."

So, having made a circuit of some five miles or more, we rapidly retraced our steps, and it was really a relief to escape from such oppressive gloom, and to enjoy once more the bright light and exhilarating air of a glorious winter's day. Certainly Mammoth Cave well deserves its reputation as one of the world's wonders. To examine it richly repays those who have the opportunity to do so. J. W. A. WRIGHT.

Steamer Suevia, January, 1876.

Tin.

Tin ore in America? Yes! In Maine a large deposit exists. At a meeting of the Boston Society of Natural History, December, 1860, Professor C. H. Hitchcock, State Geologist of Maine, exhibited specimen crystals weighing over five pounds. Gen. Samuel J. Anderson and Hon. E. L. Hamlin, of Portland, Maine, have similar crystals. David W. Hendrickson, of Red Bank, N. J., Professors Holmes and Billings, of McGill College, Montreal, Professor Forrest Shepherd, of New Haven, and Professor Averill, of Cambridge, Mass., have many crystals of Tin ore, or Cassiterite, from the Maine mine. In 1867, John W. Quincy, Esq., of New York, one of the most prominent metal merchants, made an effort to have this valuable ore brought into use, but prominent parties interested in the monopoly of the Tin trade have persistently discouraged the development of these Tin mines. Prof. Goodale asserts that no where in the known world have so large specimens been found as in this locality in America. The above authority we consider sufficient to pledge our belief that the centennial, which promises so much for the use of our Iron abroad, will equally encourage the use of our Tin at home. Tin is one of our largest articles of commerce and of import; its uses are numerous and vast, and the consumption very great indeed. Europe has drawn many millions annually from us in gold in payment for Tin. Why not turn the golden balance of trade in our favor, through such channels of traffic as recognize the stamp and credit of the United States Government as a legal tender? Our mines are richer, our ores purer, and more easily produced than those of Mexico and Europe. Our people should feel a national pride in any new discovery, and assist it as a part of the means to give a balance of trade in our favor, and so far aid in stopping the disgrace which our national credit has sustained in the prolonged depreciation of our currency.—[New York Mercantile Journal.]

It ought to be also well known that valuable deposits of tin are found in the Temescal Mountains some 60 or 70 miles inland from Los Angeles, in this State. These mines would have been actively worked long ere this, had it not been for the unsettled nature of the title to the land on which they are located; but we believe this matter is now in a fair way of adjustment, and that we may reasonably expect soon to add tin among the valuable articles of export from California.

A NEW WINE.—The ravages of the phylloxera among the vines of France have incited many attempts to discover a new kind of beverage to take the place of the juice of the grape. The Marquis de Villeneuve reports that in China a pseudo-wine called Tsien-lai is much used, which is concocted from a preparation of iron plants, common in that country, and mixed together in certain proportions. The plants are dried and powdered and made into a paste, which is sold in the form of balls and squares, at the rate of about three pence a pound. One square or ball will make several pounds of fermented liquor, pleasant to the taste and much resembling wine, which is now sought after by Europeans and others living in China. A fictitious brandy is also prepared in the same way, and the manufacture is so simple that with a capital of £5 or £10, to purchase the apparatus, a man may make 25 gallons of "brandy" a day. The Marquis de Villeneuve affirms that the liquors thus produced are of good quality and possess no injurious ingredients.

THE EXPORT OF AMERICAN LEATHER has more than doubled within three years. The export of 1873 was 800,000 sides; that of 1875 was 1,800,000.

The Mines of Arizona.

Col. H. C. Hodge furnishes some interesting information to the *Santa Barbara Index* in regard to the mines about Mineral Park, Arizona. We condense from his letter of March 18th as follows:

For a month past I have been exploring the wonderful mineral veins for a distance of 30 miles about Mineral Park, and find much of interest to the general public, and of especial interest to those interested in mines and mining. My explorations have been in the Cerbat, Hualapai and Peacock mountains. In the Cerbat range is included the Mineral Park, Chloride, Cerbat and Stockton mines, which extend in a northerly and southerly course some 15 miles, with a width of two to five miles. The number of claims located and recorded in these localities run well up into the hundreds, if not thousands. The ore from the Keystone, which is now being worked to a depth of 200 feet, is now paying at the Mineral Park mill \$200 per ton. Much of the selected ore from this mine will go far above these figures. The ore now on the dump pile of the Lone Star is very rich in horn and ruby silver. It is believed that the ore now at this mine now ready for milling will average \$300 per ton. The ore of the Index is nearly as good. The Metallic Accident, T. J. Christie owner, has shipped some 15 or 20 tons to San Francisco, which gave over \$1,400 per ton. At Chloride camp, five miles north, there are a large number of equally good mines as those mentioned, and the owners of several of them have shipped many tons of the ore to San Francisco, which paid from \$300 to nearly \$1,000 per ton. The most promising of the Chloride mines are the Empire, Schenectady, Pink Eye, Pennsylvania, etc. The mines at Mineral Park and Chloride are all silver, carrying more or less galena, antimony, sulphurets, etc. At Stockton there are some very fine developments, and from time to time shipments of ore to a large amount have been made to San Francisco, which gave returns of from \$200 to \$1,000 per ton.

The great want of the country is railroad communication, and capital to erect mills and machinery to work the rich ores. The Mineral Park mill company, incorporated in California, have a new and complete five-stamp mill now in operation, and is a decided success. Since starting a few days since, it has been working ores from the Keystone mine of this place, and from the Hackberry mine, 30 miles east in the Peacock mountains, the average yield being \$200 per ton; this result in any other country would create a wonderful excitement. The Hualapai mountains are about 25 miles east of south of this place, and extend far off to the south for nearly 100 miles. The range is a mineral belt of great richness.

The Peacock mountains are some thirty miles east of Mineral Park, and in this mountain is the celebrated Hackberry mine, discovered about one year since by Messrs. Ride-mour & Crozier, who are now working it successfully. Messrs. Davis & Randall, merchants of this place, have just completed a five-stamp mill for working the ore, which will average over \$200 per ton. A score or more of small but perfect five and ten stamp mills are needed in this country, and would be a source of great profit to the owners, who, for a time, could have \$40 and \$50 per ton for working ores, and would help to launch this country upon a sea of prosperity never excelled in any mining country. The water in all this mountain region, with few exceptions, is very good, though not as abundant as in the mountains of California. Grass is abundant in all the mountain regions, as well as upon the great plains and valleys, but in most of the great plains and valleys water is scarce. In time, no doubt, artesian water will be found in abundant quantities, as the geological and other indications give assurance as positive as can be found in any country.

The African Coast.

The surf on the African coast, says a letter writer, is ever a wonder and a danger. There is no coast in any part of the world which possesses less ports or harbors of refuge. You may travel a thousand miles almost without finding a cove or harbor where a ship could anchor quietly without being rocked by the surf waves. Try along the whole of the grain, the ivory, the gold and the slave coasts and there is not one port. But, fortunately for ships trading to those places, there is seldom a hurricane blowing, so that they are able to anchor about a mile from the shore. There is never any dead calm, though the sea in the morning is stirred up into wavelets by the breeze from oceanward. During the night it is moved by the land breeze, so that ships anchoring in the roadsteads are ever to be seen rolling uneasily; they are never at rest. Unceasingly the long lines of waves are to be traced rolling onward to the shore, gathering strength as they advance nearer, until, receiving the ebbing waters flowing from the beach from preceding seas, there is a simultaneous coiling and rolling, and at once the long line of waves is precipitated with a furious roar on the land. Where the water meets a rock a tall tower of spray and foam is suddenly reared, the wave line is broken and is in mad confusion. Where the beach is smooth and of sand you may trace a straight, unbroken line of foam nearly a mile long.

THE BLOOD COST OF COAL.—It is estimated that within the last half century 50,000 men have been killed by accidents in the coal mines of England, and 200,000 severely wounded.

MECHANICAL PROGRESS.

Some English Metal Work for the Centennial.

The London Times, of the 11th ult., contained a description of a handsome collection of artistic metal work which has been prepared by Messrs. Elkington & Co. as their contribution to the Centennial exhibition. It consists of several hundred articles, worth, in the aggregate, about £100,000, and will be put in a place of honor in the center of the English department, where it will occupy a quarter of the space beneath the lower. The collection does not include any of the more common kinds of electro-plating, such as spoons, forks, dishes, or other articles of daily use, but consists entirely of work of a highly decorative kind in dinner services, vases, shields, mirror frames, plaques and tazza. The whole may be arranged under the three principal classes of *repousse* work in silver, enriched by gilding and enamellog; *repousse* work in iron, decorated by inlaid and damascened patterns in gold and silver; and champlevé and cloisonné enamels. In all of these departments considerable progress has been made since the Vienna exhibition; but in none of them is it more noticeable than in the cloisonné enamel, which far surpasses the Chinese or the modern Japanese examples of the art, and even approach very nearly to the old Japanese. After an interesting description of the process of enameling at Birmingham, the Times goes on to say that among the noticeable specimens of the Messrs. Elkington's cloisonné, may be mentioned a pair of cylindrical vases, about a foot high and four or five inches in diameter, covered with floral decorations of great beauty. One of the finest specimens of the *repousse* work in iron of this firm is an oval mirror frame damascened with birds and arabesques. The arabesques are simply burnished, but the birds are sculptured until the outline of almost every feather may be traced. Other fine specimens will be sent to the exhibition, among them a dessert service, a tazza, and some plates. The dessert service consists of five pieces in iron *repousse*, inlaid with gold and silver, relieved by exquisitely chased panels of oxidized silver, and supported on crystal pillars, delicately engraved with incised and gilt ornamentation. The tazza is in *repousse* silver, with a border of iron, damascened and incised with gold, and the principal subject is a Pompeian lady at the toilet, attended by her slaves. The design was executed by M. Morel-Ladenil, the artist of the Helicon vase and of the Miltonshield, who was engaged two years upon it.

The decorative dinner and dessert services are of various styles, Egyptian, Grecian, Pompeian, Romano-Greek and Renaissance. They are made either in massive silver or in copper electro-plated, in either case relieved by gilding; and two complete services, consisting of center pieces, plateaux, candelabra and fruit stands, are richly decorated with champlevé enameling and paneled with gold.

There is also a selection of reproductions of the art metal works in South Kensington museum, and not the least excellent part of the collection will be the show cases of shonized wood richly adorned with incised and gilt decorations. The designs of the greater part of the work were prepared by M. Willms, chief artist for the Messrs. Elkington.

TWENTY-TWO INCH PLATE.—The thickest armor plate ever produced was rolled at the works of Charles Cammell & Co., limited, at Sheffield, recently. From four and one-half inches, the size has been increased step by step till it has reached 14 inches, and Messrs. Cammell & Co. have succeeded in producing one of 22 inches, this being eight inches thicker than any armor plate ever yet rolled. The plates of which this is a sample are intended for the *Dandolo* and *Duilio*, two war vessels now being built in Italy for the Italian Government. The gun to be used in testing this great plate, which weighs 35 tons, is one of the 100 ton guns now being made by Sir William Armstrong & Co., at Newcastle. The vessels are to have two turrets, and each turret will contain two of these enormous pieces of artillery. Mr. Cammell stated that if these guns succeeded in penetrating this plate he should have no hesitation in rolling one of 30 or even 40 inches in thickness. — *Monetary Gazette*.

IMMENSE WIRE ROPES.—Commodore Shufeldt has ordered the proper authorities of the Boston navy yard to make several five-inch steel wire hawsers. These will probably be the largest wire ropes ever made. The Navy Department has use for immense hawsers to tow monitors and vessels in distress. They are put on board the men-of-war for use when required. The usual appliance is a 12-inch hemp rope, but it swells when wet, and gets very heavy by absorption of water. The steel wire hawsers will be seven inches less in diameter, much lighter, non-absorbent, more pliable and durable, and in every respect better. This is a curious and, in fact, wonderful advance in the application of steel and iron to commercial uses. A hemp hawser, 12 inches thick, is a wonderful thing in itself, but a steel wire hawser, five inches in thickness, better answering the same purpose, is something fruitful of thought to the student in shipbuilding and rigging. — *New York Bulletin*.

Patents in the United States.

The last annual report of the U. S. Commissioner of Patents states that there were received during 1875, 21,638 applications for patents, of which 14,837 (including reissues and designs) were granted. Following the practice of former years, the commissioner gives a table showing the number of patents granted to residents of the different States, Territories and foreign countries during the year. It is interesting to notice the wide differences which exist. For instance, in Idaho Territory only one patent was granted, the population being 14,999. Against this we may put the State of New York, where 3,771 patents were issued, being in the proportion of one patent per 1,163 inhabitants.

The density of the patent taking population is greatest of all in the District of Columbia, where one person out of every 615 appears to be a patentee. This, however, can hardly represent the inventive activity of the district, and the high proportion is probably due to the fact that many inventors acquire a temporary domicile in Washington for the purpose of prosecuting their applications. The absolute number of patents taken out is small, reaching only 214. New Mexico Territory contributes the smallest proportion of patents, there being only one to every 37,101 inhabitants. The agricultural States do not, as might have been expected, make much show. Only 31 patents (one to every 32,161) come from Alabama. North Carolina contributes 37, or one to every 28,956, and South Carolina sends 46, or one to every 17,513 persons.

The office is rapidly outgrowing the accommodation which the building affords, especially in the model rooms. About 10,000 rejected models were removed in consequence "to an open space under the roof of the west wing of the Patent Office building. The floor of this attic and the model shelves are composed of rough boards, and the place itself is very difficult of access. The trouble increases yearly, and if no provision can be made for relief in this regard it will be necessary to do away entirely with models." The sooner the better, say all who have anything to do with patents. — *Iron Age*.

The Telemeter.

A Berlin correspondent of the London Times states that, according to trustworthy information, M. Le Boulanger, a Belgian major of artillery, has succeeded in constructing an instrument indicating the distance between two armies by the mere report of the discharge. The moment the enemy fires a shot, the action of the report upon the telemeter—that is the name of the machine—marks the distance to a fraction. The instrument is entirely self-acting, easily kept in order, and requires no particular experience of intricate calculations to use it aright. The experiments to which it has been subjected in the artillery grounds of this and some other countries are stated to have been a complete success, as regards cannon. Whether the machine works with the same accuracy the report of one or many rifles, and whether the small specimens for infantry and cavalry use are as reliable as the larger ones attached to the guns, is not quite so certain. While the artillery trial may be regarded as at an end, experiments in the rifle grounds are still going on, and, it is said, with fair prospect of producing a satisfactory result. Should the latter expectation be realized, war will have a very different thing from what it has been, seeing that in the last campaign only one shot in ten hit; but even if the invention is confined to the artillery, its effect must be tremendous considering the present deadly efficiency of fire arms. One of its principal advantages, it is supposed, will be to enable the gunners in a coast battery to determine the position of a hostile ship—a calculation hitherto fraught with special difficulty. The adoption of the telemeter by the German artillery on land and sea may be regarded as certain.

Cork Springs.

We are assured by reports of recent experiments that cork is likely to supersede the use of India rubber in machinery, especially where the pressure is very great. A pressure of great power will destroy India rubber, causing it to break or split up into small pieces, losing its elasticity entirely. No such result follows in the case of cork, properly prepared. Cork is first soaked in a mixture of water and molasses, which gives it some softness and permanent moisture. It is then cut into discs eight inches in diameter. As many of these as are needed are put into a cast-iron box, an iron lid applied, and corks being down to half their original thickness, a bolt is run through the center and nut and screws hold them in place. A spring thus formed, tested by a ten tons pressure, shows an elasticity like compressed air.

GIFFARD'S COLD AIR ENGINE.—The principle of the cold air generators is well known. When air is subjected to compression, heat is developed. When deprived of the heat, and subsequently allowed to expand, it re-absorbs heat so eagerly as to produce a notable lowering of the temperature, which is susceptible of application to a variety of practical purposes. A new description of airtight cylinder, new joints, and a new stuffing box have enabled Mr. Giffard to so far improve upon previous machines that his cold engine, when driven by an ordinary steam engine, will make 20 pounds of ice for each pound of fuel burned.

SCIENTIFIC PROGRESS.

Measuring Earthquakes.

There is scarcely any movement or change in nature which modern science does not measure. No matter how great or how small the phenomena may be, some instrument is devised for gauging and registering them. The vocabulary of science fairly bristles with strange polysyllabic names ending in *meter*, which have been formed as designations of these ingenious contrivances. Meteorology has its thermometers and barometers, and scores of less familiar hygrometers, pluviometers, anemometers, and so on; and every other branch of physical science can show a similar catalogue.

The *seismometer* is a measuring machine of which some of our readers may never have heard. The word is derived from the Greek *seismos*, a shaking, and means an earthquake measurer; for the physicist applies his gauges even to earthquakes. There is an instrument, known as the *sphigmograph*, by which the heart is made to record in expressive curves the force, rapidity, and other characteristics of its beating. The *seismometer* measures the heart-throbs of Mother Earth, and registers every pulsation that thrills her mighty frame. Of course it is only in certain localities that this can be done, just as it is only to certain parts of the body that the *sphigmograph* can be applied. One of these localities is the observatory on Mt. Vesuvius, of which Professor Palmieri is the director. This observatory is situated on a spur of the mountain, close to the Hermitage or half-way house on the route usually taken by ascending tourists. The seismometers are in the second story of the building, but rest upon solid piers of stone reaching to the earth. The instrument for the automatic registration of vertical shocks is a fine metallic point, suspended by a coil of wire just over the surface of a cup of mercury. The slightest upward motion of the earth carries the mercury up to the wire, completing a galvanic circuit which instantly stops a clock and rings a bell to notify the observer to reset the apparatus and observe future phenomena. To measure the intensity of vertical shocks, small magnets are suspended over a cup of iron filings by means of coils of wire of different strengths. When a vertical shock occurs, some of these magnets dip into the iron filings, and to one of them a light index is attached for measuring the intensity of the shock. For horizontal shocks the registering apparatus consists of U-shaped glass tubes, partially filled with mercury, and set to the four cardinal points. A small weight rests on the mercury and is attached to a silk fiber, which runs over an ivory pulley and has a counterpoise at the other end. On each pulley there is an index and circular scale to mark the angle through which it turns. A horizontal shock causes the mercury to rise in the tube or tubes corresponding to the direction from which it comes, the weight is raised and the pulley marks, by means of the index, the angle through which it has turned. At the same time the mercury in rising completes a galvanic circuit which stops a clock and rings a bell. The galvanic current from either registering apparatus also starts another clock, the pendulum of which has hitherto been held out of perpendicular, and this clock allows a roll of paper to be unwound, on which, by means of electricity, a pencil traces the movement of future shocks, the spaces between the markings indicating the time elapsing between the shocks.

Professor Palmieri, who has the charge of these seismometers and all the other apparatus of the observatory, is not only an eminent physicist, but a brave man. He has remained at his post when Vesuvius was in active eruption, calmly watching the indications of his instruments, amid the elemental warfare, cool as a veteran under fire, though like him really in peril of his life and fully conscious of the danger. We trust that it may not be his fate to fall a victim to his devotion to science, as the elder Pliny did in an eruption of the same Vesuvius 18 centuries ago. — *Jour. of Chemistry*.

NITRO-GLYCERINE TRANSPORTATION.—Senator Jones, of Nevada, has introduced a bill in the United States Senate, which absolutely prohibits the transportation from one State or Territory to another, or to or from a foreign country, of nitro-glycerine in any other form than that of dynamite, and prohibits the transportation of the latter substance except by merely freight conveyances, and on condition that it is packed in metallic cases, and unaccompanied with any means of exploding it. In the event of a death being caused by explosion when dynamite is transported in any other manner, every person who knowingly permitted or aided its transportation is to be deemed guilty of manslaughter.

PRESERVING PLANTS WITH THEIR COLORS.—A French gentleman, M. Boulade, has discovered that if freshly gathered plants are spread out between sheets of filtering paper in the usual herbarium manner, and then heated between two bricks in an oven for two or three hours at about 150 degrees Fahrenheit, they will be perfectly and permanently preserved without impairment of the most delicate colors. The process is rendered more rapid and certain if the layer of filtering paper next the flowers be changed after about an hour.

Fascinations of Science—Straightening the Mississippi.

The Mississippi river between Cairo and New Orleans was 1,215 miles long 176 years ago. It was 1,180 after the cut-off of 1722. It was 1,040 after the American Bend cut-off (some 16 or 17 years ago). It has lost 67 miles since. Consequently, its length is only 973 miles at present. Now, if I wanted to be one of those ponderous scientific people, and "let on" to prove what had occurred in the remote past by what had occurred in a given time in the recent past, or what will occur in the far future by what has occurred in late years, what an opportunity is here! Geology never had such a chance, nor such exact data to argue from! No "development of species," either! Glacial epochs are great things, but they are vague—vague. Please observe: In the space of 176 years the Lower Mississippi has shortened itself 242 miles. That is an average of a trifle over one mile and a third per year. Therefore, any calm person, who is not blind or idiotic, can see that in the old Chlotio Silurian period, just 1,000,000 years ago next November, the Lower Mississippi river was upwards of 1,300,000 miles long, and snaked out over the Gulf of Mexico like a fishing-rod. And by the same token any person can see that 742 years from now the Lower Mississippi will be only a mile and three-quarters long, and Cairo and New Orleans will have joined their streets together, and be plodding comfortably along under a single mayor and a mutual board of aldermen. There is something fascinating about science. One gets such wholesale returns of conjecture out of such a trifling investment of fact. — *Mark Twain*.

New Specific Gravity Apparatus.

M. Paquet announces to the *American Chemist* the arrangement of a new specific gravity apparatus, which is particularly useful in experiments on small quantities of solids and in mineral determinations. The instrument has the form of Baume's areometer, with a pear shaped bulb, carrying a stem, which is surmounted by a larger tube closed at the bottom and divided into cubic centimeters and tenths of cubic centimeters. The 0 is placed on a level with the second cubic centimeter, and the instrument is ballasted in such a way that it sinks into the water to the lower end of the stem when the tube is filled with water to the 0 of the large tube, containing, for example, 2 c. c. of the liquid. The stem has also a graduation, of which the 0 is at the lower end, and the other divisions are obtained in the following manner: Suppose the instrument is to be used for weights below 6 grammes; into the upper tube, containing already water to 0, is poured 6 grammes or 6 c. c. of water. It sinks to a certain depth, which is marked 60, and the distance between that point and 0 is divided into 60 parts. To use this instrument, put into the large tube 2 c. c. of water; it rises just to 0. Plunge it into water, it stops at 0. Put the body into the upper tube, which will bring the level of the liquid in this tube to the division 3, for example. The volume of the body is then 3 cubic centimeters, while the instrument sinks into the water to a certain division of the stem, 55, perhaps. The weight added is 5.5 grammes; the density is then 5.5—3.

This instrument can be used for determination of the specific gravity of liquids, in which case the operation is very nearly the same as with Roussau's apparatus.

A QUATRAIN OF GOOD RULES FOR THE STUDENT.—The following four precepts of D-scarles are quoted by Viollet-le-Duc in his "Discours." The first is never to admit the truth of anything without thorough conviction; that is, sedulously to avoid precipitation or prepossession of judgment, and to accept nothing as fact which does not recommend itself as clearly and distinctly to my mind that there can be no possible occasion for doubt. The second is to divide the subject I am investigating into as many heads as it is capable of, to the end that its difficulties may be the more readily resolved. The third, so to order my thoughts that, beginning with the most simple and comprehensible objects, I may gradually ascend to the contemplation and understanding of the most complex, assuming a regular order of induction in those subjects which do not seem naturally so to arrange themselves. The last, always to make such thorough and comprehensive reviews of my studies as to prevent the possibility of omitting or not giving due weight to any of the considerations which bear upon them.

NEW ELECTRIC LIGHT.—A new electric light, experimented upon some weeks ago on the roof of the Siemens-Halske works, at Berlin, proved so successful that ordinary writing could be read at the distance of a mile. When the light was thrown toward the clouds by means of a mirror a luminous train appeared thereon, which much resembled the tail of a comet, and drew together great crowds of spectators in the streets. Signals made by the instrument were also repeated upon the clouds, becoming thus visible at a very great distance. The experiments were made in the presence of a large number of artillery and other branches of the government service, and were continued for nearly two hours. The instrument, which is provided with a locomotive engine, will be set up in the Tegel artillery polygon for further experiment, the German war department having the intention of purchasing several of the machines for military use, both afloat and ashore. — *Revue Militaire d'Etranger*.

MINING SHAREHOLDERS' DIRECTORY.

Compiled every Thursday from Advertisements in the Mining and Scientific Press and other S. F. Journals.]

ASSESSMENTS.—STOCKS ON THE LIST OF THE BOARDS.

Company.	Location.	No. Amt. Levied.	Delinq't. Sale.	Secretary.	Place of Business.
Baltimore M Co	Washoe	11 100 Mar 24	May 1	May 20	C A Sankey
Belmont M Co	Nya Co Nev	8 50 Mar 24	May 1	May 20	Frank Swift
California S M Co	Washoe	17 100 Apr 18	May 1	June 9	R Wescor
Cona Co M Co	Cal	1 100 Mar 4	Apr 15	May 1	R H Brown
Crown Point M Co	Washoe	25 100 Apr 5	May 1	May 31	C E Elliot
El Dorado South Con M Co	Nev	9 200 Mar 31	Apr 10	May 17	W Willis
Empire M Co	Washoe	21 100 Mar 2	Apr 5	Apr 25	W E Dean
Empire M Co	Nev	1 100 Mar 1	Apr 15	Apr 25	W E Dean
Genova Co M Co	Nev	20 100 Mar 4	Apr 10	May 1	J T Milliken
Gidd & Curry S M Co	Washoe	23 100 Mar 22	Apr 26	May 16	A O Durbow
Great Eastern Con Q M Co	Cal	3 100 Apr 11	May 12	May 20	J G Riley
Hahn & Hunt S M Co	Ely Dist	12 49 Mar 9	Apr 17	May 12	H O Kistead
Hussey Con G & S M Co	Cornucopia	1 15 Apr 31	May 18	June 6	R H Brown
Knickbocker M Co	Washoe	15 100 Mar 31	May 8	May 25	J H Sayre
Lady Bryan M Co	Nev	11 100 Mar 27	Apr 27	May 18	W P Reddick
Leopard M Co	Elko Co Nev	1 100 Mar 31	May 3	May 22	R H Brown
New York M Co	Washoe	9 100 Mar 24	May 1	May 19	D L Thomas
New York Con M Co	Washoe	18 835 Mar 19	May 1	May 19	D L Thomas
North Yona Virgola M Co	Washoe	2 100 Mar 27	Apr 12	May 14	J M Jones
Prussian G & S M Co	Nev	7 100 Mar 10	Apr 12	May 11	R H Brown
Pauper M Co	Idaho	7 20 Feb 26	Apr 3	Apr 21	W F Bogart
Pochs M Co	Washoe	21 100 Mar 2	Apr 5	Apr 25	W E Dean
Savage M Co	Washoe	22 200 Apr 4	May 8	May 27	E B Holman
Seg Belcher S M Co	Washoe	15 500 Apr 11	May 16	June 6	Geo D Edwards
Senator S M Co	Washoe	13 500 Feb 29	Apr 18	Apr 27	J H Sayre
South Yona Virgola M Co	Washoe	12 100 Mar 2	Apr 5	Apr 25	W E Dean
Union Con S M Co	Washoe	14 500 Apr 17	May 22	June 12	W H Watson
Webfoot M Co	Elko Co Nev	3 25 Apr 14	May 15	June 12	A G Jennings
Wheeler M Co	Cal	1 100 Feb 2	Apr 2	Apr 22	J M Buchanan
Yellow Jacket S M Co	Washoe	22 100 Mar 18	Apr 21	May 24	G W Hopkins

OTHER COMPANIES.—NDT ON THE LISTS OF THE BOARDS.

Alameda Coal M Co	Cal	1 10 Mar 17	Apr 20	May 30	F Budro
Banzo S M Co	Utah	1 50 Mar 13	Apr 22	May 13	W T Townsend
California Watch Co	Alamado Co Cal	1 50 Mar 13	Apr 22	May 13	H T Green
Columbia M Co	Washoe	1 25 Apr 13	May 15	June 6	Frank Swift
Con Reform M Co	Lower Cal	3 50 Mar 24	Apr 26	May 19	A D Carpenter
Cornucopia Con M Co	Nev	1 100 Mar 2	Apr 5	Apr 25	W E Dean
Dever Co M Co	Sonoma Co Cal	75 Apr 3	May 15	June 6	F P Reynolds
East Branch M Co	Plumas Co Cal	4 25 Jan 21	Apr 6	Apr 29	A C Sweetser
East Yellow Jacket M Co	Washoe	4 100 Mar 20	Apr 29	May 23	F T Garner
Empire Con M Co	Cal	7 100 Mar 20	Apr 29	May 23	F T Garner
Fresno Quicksilver M Co	Cal	3 15 Feb 20	Apr 17	Apr 28	R Wegener
Golden Sun G M Co	Butte Co Cal	1 25 Mar 1	Apr 4	Apr 21	R Wegener
Green Valley Blue Gravel Co	Cal	3 50 Mar 13	Apr 13	May 26	A D Carpenter
Grout Co M Co	Washoe	1 50 Mar 21	Apr 21	May 9	F Meyer
Kennedy M Co	Cal	12 100 Mar 28	May 2	May 22	A Wissel
Klamath Quartz M Co	Cal	3 300 Mar 2	Apr 10	May 2	J F Nesmith
Lady Franklin & S M Co	Cal	50 Apr 3	May 15	June 6	E Lutz
Lindon Quicksilver M Co	Napa Co Cal	4 4 Feb 28	Apr 24	Apr 24	A Haley
Memoir M Co	Nev	5 5 Mar 15	Apr 13	May 9	W E Dean
North Bloomfield G M Co	Cal	42 100 Mar 20	May 1	May 26	M P Gann
North Clipping M Co	Washoe	1 10 Mar 14	Apr 19	May 19	J Maclellan
North Dayton G & S M Co	Nev	1 50 Mar 14	Apr 19	May 6	C S Culverwell
Oceanic Q M Co	Cal	3 50 Mar 16	Apr 18	May 5	G C Funk
Olympia R R & M Co	Oregon	1 100 Apr 19	May 22	June 12	David Wilder
Omaha T M M Co	Cal	10 100 Apr 13	May 15	June 1	David Wilder
Reliance M Co	Washoe	1 100 Mar 2	Apr 15	May 10	T H Henderson
Renton Coal M Co	Washington Ter	12 500 Mar 18	May 15	July 10	T H Henderson
San Jose M Co	Cal	1 100 Mar 18	May 15	July 10	T H Henderson
Silver Sprout M Co	Nev	1 100 Mar 23	May 6	May 31	O H Bogart
Stock Broker M Co	Cal	10 100 Mar 4	Apr 5	Apr 26	L Leavitt
Table Mt Alpha M Co	Cal	30 Mar 14	Apr 17	May 3	D K Trump
Wall Street M Co	Cal	3 100 Feb 23	Mar 31	Apr 24	L Kaplan
West Point G & S M Co	Cal	1 50 Mar 25	May 1	May 22	S K Nichols
White Mountain M Co	Amador Co Cal	1 50 Mar 25	May 1	May 22	S K Nichols

MEETINGS TO BE HELD.

Name of Co.	Location.	Secretary.	Office in S. F.	Meeting.	Date.
Alta Con M Co		H H Whiting	419 California st	Annual	May 1
Benton M Co		Wm H Watson	302 Montgomery st	Special	Apr 26
Boyle M Co		Wm H Watson	302 Montgomery st	Special	Apr 26
Cooper H & S M Co		P G Wood	418 Montgomery st	Special	Apr 26
Empire Q M Co		J F Parrott	405 Front st	Special	Apr 26
Hartford M Co	Cal	Called by Trustee	419 California st	Special	May 1
Independent & Omega M Co	Washoe	Jos Maguire	419 California st	Annual	Apr 28
Indian Queen M & M Co	Nev	A K Durbow	Nevada Block	Annual	Apr 28
Justice M Co	Washoe	J S Kennedy	Merchants Ex	Annual	May 1
Knecht M Co	Washoe	E E Stone	419 California st	Special	May 1
Michigan G & S M Co	Washoe	A C Hammond	507 Montgomery st	Special	April 28
Morgan M Co		B F Hughes	308 California st	Annual	May 1
New Idria M Co	Cal	Mickle	Bank of California	Annual	Apr 28
Omaha T M M Co		L K Plan	Merchants Ex	Annual	May 1
Oakland G & S M Co		W H Watson	302 Montgomery st	Annual	Apr 28
Orion Hidden Treasuro M Co	Nev	D A Jennings	419 California st	Annual	May 1
Prig M Co	Nev	Wm E Elliott	419 California st	Annual	May 1
St. Kohler R & R Works Co	Cal	A C Hammond	401 California st	Annual	May 1
Senator Con M Co		Geo C Munro	419 California st	Annual	May 1

LATEST DIVIDENDS (within three months)—MINING INCORPORATIONS.

Name of Co.	Location.	Secretary.	Office in S. F.	Amount.	Payable.
Alta S M Co	Washoe	Wm H Watson	302 Montgomery st	Stock	Mar 27
Alps M Co	Ely District	Ed D Squire	Stevenson's Bldg	50	Apr 15
Black Bear Quartz	Washoe	H C Klobe	316 California st	40	Mar 22
Black Bear Quartz	Cal	W L Oliver	401 California st	2 00	Apr 10
Black Bear Quartz	Washoe	Chas H Fish	401 California st	5 00	Apr 10
Black Bear Quartz	Nevada Co Cal	D A Jennings	401 California st	5 00	Apr 10
Black Bear Quartz	Sierra Co Cal	Chas C Colahan	401 California st	5 00	Apr 10
Black Bear Quartz	Washoe	Wm H McCullough	419 California st	5 00	Apr 10
Black Bear Quartz	Nev	R H Brown	402 Montgomery st	15	Feb 15
Black Bear Quartz	Nev	W Willis	402 Montgomery st	15	Apr 10
Black Bear Quartz	Nev	D F Verjona	402 Montgomery st	30	Mar 10
Black Bear Quartz	Washoe	Oliver G Wood	534 California st	50	Feb 24

Mining Share Market.

The week opened upon a rather weak market, with the share decidedly in the ascendant, and almost all the stocks showed a decrease in amount of sales and prices realized from our latest last week's quotations. On Tuesday there was quite a tumble, notably among the Bonanza stocks, Ophir going down to \$64½ and Con. Virginia touching \$75½, the lowest figure it has reached since the division of the stock. Wednesday morning witnessed a rally, and an advance all along the line of from \$5 down; but the upward tendency had spent its power before the day was over, and to-day (Thursday) opened upon another declining market, with lower quotations for some of the leading stocks than they had attained on Tuesday. It is evident that the bears have not, as yet, ended their attack on the leading Bonanza stocks, as the up-and-down movement manifested in these securities within the past few days indicates a mighty struggle of powers behind the scenes.

Consolidated Imperial made its first appearance upon the boards on Monday, meeting with good demand and selling at \$7. It has since been fluctuating between that figure and \$6.

CENTENNIAL TRAVEL.—It is stated that every berth on every foreign steamer to arrive in Philadelphia from the 15th of May to the 15th of September has been taken. Passengers intending to go to Philadelphia from this coast over the Central Pacific are also engaging sleeping arrangements for several weeks and even months ahead. A large portion of the accommodations for the month of May are already secured by parties who have booked their names for certain days on which they wish to start.

OPPOSITION OF ENGLISH MINERS TO INNOVATIONS.—It is well known that the English miner, as a body, are very jealous of innovations. The miners of Cornwall have ever been adverse to the introduction of machinery, as, to their minds, being calculated to supplant manual labor. Gradually, however, it has been introduced in several mines, and we are glad to learn that the miners are now disposed to regard with favor the very machinery which comes nearest to hand work. In Cornwall, at present, the boring machine question is much discussed by mine managers, agents and workmen. The working miners now seem to realize that instead of taking the bread from them these machines are calculated to alleviate their labor and to obviate much physical toil; they are saved all the hard work entailed by hand boring and drilling. In addition to this, the machine does four times as much work as a man. A great deal—perhaps too much—was expected from the Darlington drill at Wheal Arger. At Dolcoath, a boring machine called the "Barrow," is about being introduced. The principal feature of this horer is, that instead of allowing it to be automatic, man has been made an integral part of its labors. At all events, prejudice against the best achievement of scientific skill is on the wane in Cornwall.

THE NEW POSTAL TREATY.—Postmaster Coey received an official letter from the Department Thursday morning, conveying the principal terms of the new postal treaty between the United States and Japan, to take effect immediately. The postage on letters hereafter will be five cents a half ounce and for each fractional half ounce. Papers will be charged two cents each under four ounces and on all other packages two cents for every two ounces. Pre-payment in all cases compulsory, and all letters or other packages not prepaid will be sent to the Dead Letter Office. The treaty takes effect immediately.

MINING SUMMARY.

The following is a mostly condensed from journals published in the interior, in proximity to the mines mentioned.

California.

AMADOR.

Good Pay.—Amador Ledger, April 15: Richd. Stocken, who now goes by the nickname of "Lucky Dick," is still turning over the auriferous earth in the neighborhood of his quartz claim, four miles above Volcano. Himself and another man are sluicing, and have averaged about \$15 each per day. There are also three small but very rich quartz veins, from which rock is being extracted. Stocken is entitled to the "lucky" prefix. He has scooped out of the earth and into his pocket over \$1,000 in a few weeks from the placer deposits alone, and the crushing of his quartz will realize probably as much more.

LINCOLN MINE.—The Lincoln company has let a contract to run a drift eastward, for \$5.75 per foot. Some claims, we believe, have secured the contract. The object is to prospect for the main ledge, as it is thought, notwithstanding the large bodies of ore heretofore met with, the mother lode has not been reached.

BUTTE.

GOLD.—Oroville Mercury, April 14: Messrs. Gummert & Brown are now the owners of the Gummert quartz ledge, situated in Oregon gulch, some six miles from town. The ledge has been worked at times since 1850. That is, the mill started then and run for three years and eight months, and was shut down at the time it was having lost everything. Some eight years ago it was started up again and is now running. Mr. Gummert was in town last Saturday, and left at the banking house of Riddout, Smith & Co. three small shares, valued at \$2,750, as the result of 12 days' run of 11 hours per day. They have a five-stamp mill, which runs by water, and the edge varies in width from six to eight feet. The quartz also varies much in value. It runs from \$8 to \$30 per ton. The mill is some two miles distant from the ledge. The tunnel has been run in such a crooked manner that it is impossible to work to advantage, and a new one will be run soon. The owners feel confident that they have reached a depth that will give them a constant return of good quartz.

CALAVERAS.

GLENCOE CONSOLIDATED.—Calaveras Chronicle, April 16: There is no more promising mining property in the county than that of the Glencoe Consolidated company. The ledge is a wide one, clearly defined, and all of its strata carry gold. A correspondent, writing us with reference to the Consolidated ledge, gives the following interesting particulars: "Parties struck a heavy body of ore on the first north extension of the Glencoe Consolidated. Ore prospects well. Still further north Eldred has a splendid prospect on the same vein. Two thousand feet south of the southern limit of Glencoe Consolidated the same vein is being opened with favorable indications, a shaft eight feet in depth showing two feet in width of ore, which will easily mill \$20 per ton. Still further south the vein has been traced and located as far as Esperanza creek. This remarkable fissure is now located for three miles in linear extent, cropping heavy bodies of pay ore, worth not less than \$20 per ton, at short distances throughout the entire length." The late discovery made by Messrs. Lewis & Fairchild is on the Glencoe Consolidated ledge. We understand that the company intend commencing active operations upon an extensive scale shortly.

RICA ROCK.—Rock of unsurpassed richness has lately been discovered in the Grasshopper mine at Mosquito. By means of the new machinery lately put up the shaft has been cleared of water and the south level extended a short distance. The mine has always borne the reputation of containing the richest ore in the country, but nothing equalling the rock now being extracted has ever been previously discovered. The quartz prospects, by the ordinary method, at least \$2,000 per ton. Parties who have seen the rock inform us that it is absolutely the richest they ever saw. The work of cutting out the rich ore will be pushed as rapidly as possible.

SHEEP RANCH.—Calaveras Citizen, April 16: We saw on Wednesday a piece of quartz from the Ferguson & Wallace mine, Sheep Ranch, which was extremely rich in gold. The piece was about two by one and a half inches square, and contained one ounce of the precious metal. A ton of such rock is estimated to be worth \$20,000. The Ferguson & Wallace is the only mine working at present. The shaft is down 240 feet, and levels are being run. Mr. Trump is putting in the pump, and the mill is kept steadily running on good ore. Mr. Woods, also, has his mill running on good ore. Rumor says he has sold his mine for \$10,000. The Calaveras company's mine, superintended by Messrs. Nicowander and True, is working 20 stamps.

EL DORADO.

NEW TUNNEL.—El Dorado Republican, Apr. 13: A preliminary survey is being made by the E. W. & D. G. M. company for the purpose of running a tunnel from the falls in Big Canon, through Spanish hill to Texas hill, for an outlet to the rich gravel mines owned by said company. If this tunnel is run it will go through some of the richest gravel in the State, and the county, and many rich leads will undoubtedly be struck. The most practical miners speak favorably of the enterprise. A good starting place has already been developed at the True lode. From the mouth of the tunnel of this mine, the hill rises very rapidly, so that if the tunnel were commenced there, it would soon run at a depth of 600 feet. The tunnel is now run to the hill 60 feet, all the way on good milling ore. The ledge or lead is six feet wide, with good walls and a gouge of 14 inches. The prospects are very flattering. The location could not be bettered. The superior advantage in this canon for mill sites are most inviting, and the water power advantages cannot be excelled. 15 or 16 inches of water, with the fall or pressure that can be had here of 600 feet, would run a 20-stamp quartz mill.

NEVADA.

BLUE TENT.—Nevada Transcript, April 11: The ground owned by the Blue Tent mining and water company is situated at Blue Tent, about five miles from this city, and consists of about 600 acres. The gravel is a part of the rich lead and gravel river channel on which the mines at Columbia hill are situated, and the channel has also been traced to the extensive claims of Jacobs & Sargent, at Quaker hill. The gravel of the lead at the point worked in the mine at Blue Tent is 400 feet in depth, and has proved by numerous clean-ups the past winter to be of a very remunerative character. The principal reason for the tunnel is, that it is known that the South Yuba claim, in which a tunnel is run from the hillside below, a distance of 600 feet, and which is 100 feet below the bedrock in that claim. This tunnel will furnish an outlet for the tillings for more than five years' work. The hole being washed out through the gravel has not yet got down to the bedrock, and much more has been done so far than what has been of surface dirt, because it keeps caving down, yet it has all paid over 30 cents for each inch of water used. The mine has the best dumpage of any in this section—it being 750 feet from the mouth of the tunnel to the bed of the South Yuba river below. Two nozzles are run on the South Yuba, one on the Blue Tent and two on the Enterprise ground. The water at present used is obtained from several ditches owned by

the company, and they purchase 800 inches of water from the South Yuba canal company. They also own a ditch which is 30 miles in length, and cost for construction \$100,000. It was commenced by Tozer, the former superintendent, in 1874, but he only completed about 800 rods that season, besides some work on a tunnel. Under the present management the work was again commenced in May, 1875, and was completed in October. There were 750 Chinamen employed on the works all last summer, and 250 white men. The ditch takes the water of the South Yuba river at a point about 200 vertical feet below the point where the South Yuba canal company gets its supply, and about the same height above where the Omega water and mining company obtains its supply. There are four and one-half miles of solid fluming at the head of the ditch, and a tunnel just below it of 1,000 feet in length. The ditch around the steep hillside, where there is danger of snow slides, was blasted into rocks most of the way, so that during the past winter not a break has thus far been made. This method was more expensive, but it will prove most economical in the end. At one of these points 450 rods of the ditch cost \$38,000 for construction. The ditch will carry 5,000 inches of water as far as Omega, where it is expected 1,000 inches or more will be sold. The ditch, when the dam is necessary, will be run to the mines of the company. During the present season it is the intention of the company to erect extensive dams above the head of the ditch at different points wherever there is an uncultivated water shed, so as to secure an abundant supply of water for the entire season. The snow on the upper line around the ditch is from eight to twelve feet in depth. Men are at work cleaning it out, and will get water to running in the course of two or three weeks. The company have expended, exclusive of purchase money, over \$250,000 for permanent improvements, and have not done yet, though it is expected the proceeds of the mines will pay for what will be done hereafter.

PLACER.

MINING ITEMS.—Dutch Flat Forum, April 13: The three claims which have commenced within the last few weeks to open to the bedrock, namely the Badger, Franklin and Silver Star, are piling up working away. The three claims are now being cleaned up, and are cleaning up for the first time this season. All the other claims we believe are under full headway, washing away the gravel as fast as water aided by labor and power can do it. At Gold Run, the Cedar and Indiana Hill claims having finished cleaning up and rigging up, are again washing. The Miami, Darlett and Gold claims are washing the latter, however, only at odd spells, much time being devoted to working up a deep ground sluice, in order to reach the gravel bank. The ditches are all running to their full capacity, and our miners continue to wear smiling countenances.

SAN BERNARDINO.

IVANPAH MINES.—San Bernardino Times, April 8: The sale of the McFarlane brothers' Ivanpah mines—machinery, teams, etc.—has been consummated to a New York company, for the sum of \$200,000. The money, although not paid here yet, was placed in the Bank of California, and tendered to the security of the company, who have been in San Francisco, and are likely to run the mines on a considerable larger scale than heretofore. It is rumored that it is the intention of the McFarlane Bros. to commence operations immediately on other mines in the district, equally rich with the old mine.

SOME representatives of capital are going in a week's time to Ivanpah to visit the copper mines of that place, which are very rich, the ore running as high as 60 per cent.

THE Big Blue mining company start upon the 15th of this month in Lone Valley district, on their property there. Mr. I. F. McFee, as superintendent, intends to sink another 100 feet on the shaft, now down 135 feet.

MR. R. D. BROWN, of Hot Springs district, is expected back in a few weeks to complete negotiations with an English company for the sale of the Consolidated Balance company mines, of that place.

LUCKY BARNEY LEE, of Lee district, is reported as having bought into the late discoveries made by the indefatigable Joe Voshay. The mines are situated about 20 miles from Palm station, near Whitewater. The assays in the gold are very high, and a defined ledge is reported.

TRINITY.

MONSTER SLIDE.—Weaverville Journal, April 15: Last week a slide in the Union Hill claim filled up the claim to a great extent and carried one of the giants down a shaft. The slide then appears to have been only a foretaste of what was to follow. About four acres, actual measurement, has broken away and is advancing steadily and bodily down over the bedrock worked in former years. All the shafts through which the company worked have been closed. The slide settled forward about 40 feet on Wednesday, completely closing up the shaft. The bank is broken far back of the ditch and the houses, which will probably slide in also. The company will clean up their ditches and bedrock ditch, which are thought to contain several thousand dollars. A partial clean-up, made some time since to put in new blocks, yielded about \$2,000, showing that the claim has pay dirt of extraordinary richness. The slide has probably shut off gravel washing for the season, which is much to be regretted, as the company have been cutting and tunneling bedrock for the past two years and had only opened in the gravel last fall, with very flattering prospects.

Nevada.

WASHOE DISTRICT.

OPHIR.—Gold Hill News, April 13: Daily yield, 150 tons of ore, keeping three mills steadily running. There is little or no change in the looks of the ore but the quality of the ore is being steadily improved. The 100-ft level a drift is being driven southward along the ledge, preparatory to cross-cutting at some future date. On the 1600-ft level drifts are being run along side of the ore body, both north and south, which, so far as exposed, is showing well. The east shaft, extending from the 1455-ft level down to the 1703-ft level, has been cleaned up until the top of the last set of the station. Members of the 1700-ft level has been reached. There is yet, undoubtedly, a large accumulation of water, slum and debris on that level which will have to be removed before the prospecting drifts can be resumed. The new incline machinery was given another trial a few days since, and found to work as perfectly as it was possible for it to do. The fourth compartment of the shaft is nearly completed down to the 1465-ft level.

JUSTICE.—Sinking the shaft below the 1000-ft level is again going rapidly ahead, the bottom in fair working ground. The north and south drifts at the 1000-ft level are steadily advancing and will soon have a considerable extension of the ledge. The main south drift has been cleaned out and repaired in nearly to the face. As soon as the face is reached it will be pushed ahead to cut the ledge and connect with the south winze now being sunk below the 600-ft level. That winze has now reached within about 10 feet of the 800-ft level. A sufficient amount of ore is being extracted from the 600-ft level to keep the Spring Valley mill steadily crushing.

LADY WASHINGTON.—Sinking the shaft is going steadily forward at a very fair rate of speed. The last 15 feet sunk has penetrated a fine clay wall, and the bottom is just now entering quartz of a highly encouraging character. The clay wall and quartz has a regular dip to the south and east about 15 degrees, and judging from the character of the formation the shaft has every appearance of being on the point of striking the

fame ledge found in the Justice mine. The large pit or the pump hoh at the 500-ft station is about completed.

GOULD & CURRY.—The shaft is again in excellent working condition, and the repairs to the north drift on the 1700-ft level are fast approaching completion. The excavations for the new pumping machinery are being pushed vigorously forward. The putting in of this machinery will not interfere at all with the working of the lower levels of the mine, as it is being placed entirely separate from them.

UNION CO.—The face of the north drift on the 1300-ft level is still in quartz and low grade ore of a very encouraging description. The body of quartz is gradually widening out as the drift advances northward. The bottom of the winze being sunk below the 1300-ft level, near the south line, is still in quartz and low grade ore. The opening out and widening of the quartz bodies on this level is giving almost a certainty of the development of paying bodies of ore when the ledge is reached on the 1455-ft level.

BALTIMORE AND AMERICAN FLAT.—The east cross-cut on the 1050-ft level is steadily advancing, without any change of interest. The north and south drifts from this cross-cut are both making fair speed and are each just entering quartz of a much more compact and richer character than that which has been found in that portion of the mine. Sinking the incline is making good headway. It has nearly reached the 1250-ft level.

NORTH CON. VIRGINIA.—Sinking the shaft is being pushed with great force and energy, the bottom in porphyry and black quartz of a very encouraging character. This quartz is of the same porous nature, and is filled with base metal sulphurets. The flow of water shows no great increase. The shaft is now down 830 feet. The machinery is working well, and everything moving along with the utmost smoothness.

MEXICAN.—There is no change in any portion of the mine. The northeast drift on the 1455-ft level is still advancing parallel with the ore vein, laying bare as it progresses a considerable portion of the ledge, ready for cross-cutting whenever it is desirable to do so. The spots and streaks of quartz occasionally encountered in the course of the drift are of the most encouraging description.

CON. VIRGINIA.—Daily yield 500 tons of ore, keeping the mills all running and crushing up to their full working capacities. The ore breasts show no change, and the immense chambers of rich deposits seem but a little reduced by the amount of ore extracted. The east drift on the 1600-ft level, running to connect with the C. & O. shaft, is steadily advancing, the face in good running ground. Great caution is taken to keep the diamond drills a long distance ahead of the face, so as to guard against tapping the heavy body of water now being drained by the C. & O. shaft. The flow of water at the bottom of the C. & O. shaft is very strong for the past week, reaching at one time as high as 53 inches, miners' measurement. It is now reduced to 43 inches. The pumps handle it with the most perfect ease, but so large a flow makes the work of sinking necessarily very slow. The shaft has been sunk 15 during the past week, the bottom being in excellent working ground and were it not for the flow of water.

CALIFORNIA.—Daily yield 300 tons of ore. Widening out and opening the ore breasts is gradually progressing on the 1500-ft level, the ore being of a very rich quality. By the last of the month the breasts will be sufficiently opened to admit of extracting a sufficient amount of ore to start another mill crushing. Sinking the winze below the level of cross-cut No. 6 on the 1550-ft level is going steadily ahead. With the exception of the extraction of ore, sinking this winze is about all the work that is being done in the mine at present. This winze will be continued downward to a depth of 200 feet or more for the double purpose of prospecting the ore vein and affording an air winze whenever the development of the mine below the 1550-ft level is commenced.

DAYTON.—The flow of water struck in the shaft last week is still strong, and has been a great hindrance to let it drain itself well before commencing the sinking. The water tapped is the same as that on the 500-ft level, that having disappeared as soon as the flow in the shaft commenced. Tapping the water at that point drains the ledge down to the 750-ft level, and leaves a perpendicular section of the ledge 350 feet in depth ready for cross-cut and prospect. On the 500-ft level the north and south drifts are steadily advancing, following the east side of the ore vein. These drifts have now laid bare the ledge for a distance north and south of 600 feet. This will give room for some lively work when the cross-cutting of the ledge is commenced. It is the intention to soon open another station at 750-ft level. The south drift on the 300-ft level is making the usual good progress.

DILLON.—Drift on the 2000-ft level is steadily advancing toward the ledge, the face is well grained, hard, black dyke, with a strong re-embance to a slate, with occasional spots of crystallization mixed through it. There is a slight seepage of water in the face, which appears to be steadily on the increase. It certainly cannot now be long before the ledge will be reached at that point, as this body of dyke has never been found over 40 feet in thickness on the levels above. Sinking the main incline is making steady progress, the bottom in fair working ground. Sinking the north winze on the 1400-ft level, to connect with the upraise from the 1700-ft level is also making rapid headway. The upraise from the 1700-ft level, to connect with this winze, is making steady progress.

HALE & NORCROSS.—The site of the old works on the surface presents a happy aspect. In one hand large forces of men are employed excavating deep pits and laying the immense stone foundations for the new pumping machinery, while on the other carpenters and stone masons are preparing the materials, and teamsters delivering the timbers and rough stone and heavy timbers. The preparation for the erecting of pumping machinery is going on the Gould & Curry, Savage, and Hale & Norcross, who are taken in connection with the immense pumps of the Chollar Combination and the C. & O. shaft, will be sufficient to extract a perfect river of water, when once in full operation, and it taken together, when completed, will have cost \$2,000,000—or more.

SIERRA NEVADA.—Sinking the shaft is going steadily forward, without stoppage or delay. It is now down 1,735 feet. The east prospecting drift on the 1000-ft level is steadily advancing in very favorable ground. The ore vein on this level is 30 to 90 feet in width, 60 feet of which is solid quartz, of a very fine character. The north and south drifts on the 1500-ft level are both steadily pushed ahead, the face of the north drift showing good indications of ore. There are no changes to relate of the prospecting drifts on the 1250-ft level. The main south drift on the 1000-ft level running to connect with the bottom of the winze now being sunk below the level of the north drift on the 700-ft level of the old shaft, is being pushed ahead with all possible energy.

BEST & BELCHER.—The main connecting drift on the 1700-ft level with the Gould & Curry, is again nearly completed, in good running order. As soon as everything is in good condition the prospecting of the ore vein on this level will again be commenced, and if no heavy flow of water is encountered to the contrary, the full character of the vein determined. It will probably take some two weeks yet to put everything in working order and to get ready.

YELLOW JACKET.—Owing to the necessity of putting in new T rails in the main incline shaft, all work on the 1940-ft level has been stopped for the present, except driving the north and south drifts from the middle cross-cut. Both these drifts are making good progress, and each are in very favorable looking ground. The east cross-cut on the Conifer line, on the 1740-ft level, is in 80 feet, the face in porphyry mixed with quartz.

CHOLLAR-POTOSI.—Daily yield 65 tons of ore, the assay value of which is \$35 per ton; this ore being taken

entirely from the old upper workings. The prospecting drifts on the 1250-ft levels have all been stopped for the present. The east and west cross-cuts from the main south drift on the 1300-ft level are steadily advancing, without any valuable change to report. Sinking the Combination shaft is making splendid progress.

SAVAGE.—The deep excavations for the reception of the heavy stone foundations and bed sills for the powerful pumping machinery now in course of construction at San Francisco are being pushed ahead with all possible energy. The tank stations and hot pits in the shaft are nearly completed down to the 1800-ft level; otherwise, no change to chronicle.

JULIA.—Sinking the main shaft is going steadily ahead, the bottom in excellent working ground. The south cross-cut from the main southwest drift on the 1600-ft level is steadily advancing, the face in very favorable ledge matter. The face of the main drift shows but little change. No material changes to report of the prospecting operations on the 1400-ft level.

UTAH.—The shaft has reached the 750-ft level, at which point a station is being opened for the purpose of cross-cutting and prospecting the ore vein. The flow of water is that point is still strong, and the rock tough and hard. There is nothing new to report whatever to report of the workings on the old upper levels.

KOSKUTH.—The north and south drifts on the 500-ft level are steadily advancing, laying bare the east side of the ledge, ready for cross-cutting whenever the management shall so decide, and the water is sufficiently drained. The face of the main south drift on the 350-ft level is still in quartz rich in gold.

KNICKERBOCKER.—Sinking the shaft is going steadily ahead, the bottom in fair working ground. It will not now be long before the shaft will have reached a depth sufficient at which to open a new level. The flow of water remains about the same as for some time past. It is easily handled by the pump.

SILVER HILL.—The main east drift at the fourth station level shows no change during the week. The water has disappeared from the north winze near the Justice line, and is undoubtedly drained by the flow struck in the main incline a week ago. The water in the incline remains about the same.

OVERMAN.—Sinking the main shaft is going steadily forward, the bottom still in hard blasting rock. The flow of water is still quite strong. The east cross-cut, on the 1100-ft level, is steadily advancing without any valuable changes to note. Nothing now of any other portion of the mine.

IMPERIAL.—The main north drift, on the 2000-ft level, which was stopped during the greater part of last week, is being again steadily advanced, the face still in rich ore. No changes of interest in any other portion of the mine. The prospects of the mine are daily improving.

GLOBE CONSOLIDATED.—The hoisting machinery, and in fact everything in connection with the surface works, has just been given a good overhauling and put in the best possible condition for a good summer's work. Work will be resumed in the mine in a very few days.

BELOHER.—Daily yield, 600 tons of ore. The mills are all running steadily, crushing up to their full working capacity. There is little or no change in any portion of the mine. The erection of the new pumping machinery is being forwarded with all the dispatch possible.

TROJAN.—The new buildings are completed and the machinery is being placed in position as fast as the workmen can succeed in doing it. It will not now be long before the hoisting works will be in fine condition for operating the mine, and the extraction of ore commenced.

CROWN POINT.—The south drift from the east cross-cut on the 1700-ft level is steadily advancing, the face in quartz and low grade ore. There are no changes to relate to report of any of the prospecting operations on the 1600-ft level.

COOCH.—Work is progressing as usual on the 550-ft level, with no important changes to note. Sinking the shaft is somewhat impeded by the strong and steady flow of water at the bottom.

CONSOLIDATED COCK.—This location is a consolidation of seven claims, of 1,500 feet each, situated north and east of the Utah. A shaft has been sunk to the depth of 210 feet, cutting a vein of promising looking ore. In the northwest drift on the 200-ft level, the rock is 75 feet in width, and has been opened upon, showing to be about seven feet in width, of fair grade and very promising appearance.

SILVER CITY.—The ore breasts and stopes continue their excellent yield of ore, with plenty in sight to keep the mill running steadily for months to come. The first shipment of bullion was made to San Francisco a few days since, but we did not learn the amount.

ROCK ISLAND.—The prospecting drifts on both the 650 and 850-ft levels are steadily advancing, the ledge showing large and well defined, but as yet affording no pay ore of any considerable extent.

CALEDONIA.—Sinking the shaft is making the usual fair progress, the rock in the bottom still being quite hard and the flow of water strong. Everything in and about the mine is working well.

COSMOPOLITAN.—All work is confined to the upraise at the north end, which is now 42 feet above the tunnel level, following the inclination of the ledge and showing some good milling ore.

SOUTH COSMOTOK.—Drifting ahead with the main west cross-cut proceeds well, the water being completely drained. Face of drift in fair working rock, showing streaks of low grade ore.

VICTA.—Drift south on main track level in very promising ground and making good headway. The old levels are yielding the usual quantity of pay ore.

MOANING STAR.—Sinking the shaft is being pushed ahead with all possible vigor, the bottom in good blasting ground. Good headway is being made.

VALLEY.—Sinking the main incline shaft is making splendid headway, the bottom in soft ledge material, carrying streaks of rich ore.

DANEX.—The water is being steadily drained from the shaft, and at the present rate of progress the 400-ft station will be clear in a very few days.

FLORIDA.—New machinery all completed and ready to start up. Sinking deeper will be started forthwith, as soon as the water is pumped out.

LEVITIAN.—Drift on the splendid ledge matter, most of which is low-grade ore, with rich streaks and bunches.

PIOTOU.—Still drifting north, with streaks of quartz coming in, giving good assays. Not ready to cross-cut yet.

NORTH DAYTON.—Fine stringers of quartz, giving good assays, continue to be met with in the face of the drift.

BOSTON.—Sinking the shaft is making the usual good progress, the bottom in very favorable material.

SENATOR.—The water is nearly drained to the bottom of the shaft, ready to resume sinking.

NORTH CARSON.—Placing the new machinery and getting ready for the active development of the mine.

PROSPECT.—Shaft sinking at a very good rate of progress, and everything working well.

DANIEL.—Sinking the shaft is making the usual good progress, the bottom in the 140-ft level pushing ahead in fine ore indications.

BALTIMORE CONSOLIDATED.—Face of drift from the lower level of the Nevada still hard rock.

NEVADA.—Face of north drift at lower level still showing finely.

PHIL SHERIDAN.—The new works are fast approaching completion.

MONUMENTAL.—Sinking this shaft is going steadily forward.

SUPERIOR.—Shaft and drift progressing and showing finely.

ROUCH AND READY.—Shaft sinking lively as usual. Nothing new.

A New Source of Rubber.

The coast region about Congo, in Africa, is becoming quite an important source of caoutchouc. The material from this locality is derived from a gigantic creeping vine (*landolphia*), which grows principally along the water courses. It covers the highest trees, and frequently considerable extents of forests are festooned down to the ground, from tree to tree, in all directions with its thick stems, like great hawsers. Sometimes its stem is as thick as a man's thigh. Above, the trees are nearly hidden with its large glossy leaves of dark green hue, and studded with beautiful bunches of pure white star-like flowers, most sweetly scented. Its fruit is of the size of a large orange, yellow when ripe, and perfectly round, with a hard brittle shell; inside it is full of a soft reddish pulp of an agreeable acid flavor, much liked by the natives. It is not easy to obtain ripe seeds, as the creeper is a favorite resort of a villainous, semi-transparent, long-legged red ant—with a stinging bite, like the prick of a red hot needle—which is very fond of the pulp and the seeds distributed through it.

Every part of the creeper yields a milky juice when wounded; but, unlike the juice of the American rubber tree, this milky sap will not run into a vessel placed to receive it. It dries so quickly that a ridge is soon formed over a cut, and the flow arrested. When collecting it, the natives make long cuts in the bark with a knife, and as the sap gushes out they wipe it off continuously with their fingers and smear it on their arms, shoulders, and breasts, until a thick covering is formed. Then they peel it off and cut it into small squares for transportation.

A NEW FUEL—ANTHRACITE COKE.—Much interest is being created in regard to a new kind of furnace fuel, which has recently been introduced in England, and which is known as "anthracite coke." It has been made near Swansea, England, from a mixture of 60 per cent anthracite, 35 per cent bituminous coal, and five per cent pitch. This coke is said to be exceedingly bright, small in grain, moderately sonorous, and of average density. It is remarkably clean. It is claimed that 192 pounds of this coke melted 30 owt. of pig iron and old railway chairs. The iron came down very hot and clean, although the quantity of coke used was less than half that usually employed at the same works. The Landore steel works company have two furnaces in blast, one on hematite, the other on spiegelisen. The latter has only recently been started; the first has been going some time on anthracite coke. The furnace is 65 feet high and 17 feet in the bosh. The make of pig iron is 300 tons per week, each ton requiring two tons of 50 per cent ore, and 18 owt. of coke; with the best Glamorgan coke 27 owt. were required to do the same work. The facts are very remarkable, and indicate that the new fuel possesses unusual value.

AN OLD ANVIL.—Mr. Norman Seymour, secretary of the Livingston county (N. Y.) historical society, writes to the *Courant* as follows: Among the relics that have been brought out so far this Centennial year, I have found in our town an old anvil weighing from 80 to 100 pounds, marked on it in figures out in the iron, "1632." This anvil was brought over from England about the year 1632 by John Moses, who settled in Dorchester, near Boston. In 1667 he moved to Simsbury, Hartford county, Conn. He had a son Timothy, and Timothy second had a son Elisha, and Elisha second came into the Genesee valley, New York, at an early day and brought the anvil with him. He died at Mount Morris in 1847, aged 86 years. This rare curiosity of the olden time is now in possession of the family of the late Elisha Moses, but it should have a place in your cabinet of Puritan relics, the Athenaeum.

DIVING IN THE OCEAN FOR FRESH WATER.—One of the hottest regions of the earth is along the Persian gulf, where little or no rain falls. At Bahrein the arid shore has no fresh water; yet a comparatively numerous population contrives to exist there, thanks to copious springs which burst forth from the bottom of the sea. The fresh water is got by diving. The diver, sitting in his boat, winds a great goatskin bag around his left arm, the hand grasping its mouth; then he takes in his right hand a heavy stone, to which is attached a strong line, and thus equipped he plunges in and quickly reaches the bottom. Instantly opening the bag over the strong jet of fresh water, he springs up in the ascending current, at the same time closing the bag, and is helped aboard. The stone is then hauled up, and the diver, after taking breath, plunges again. The source of these copious submarine springs is thought to be in the green hills of Oman, some 500 or 600 miles distant.

A RICH PLACER MINE.—The Spring Valley company, from Cherokee, brought down on April 8th a bar of gold valued at \$22,000. This is the third lot brought down inside of three weeks. The first lot was \$12,000, the second \$61,000, and now comes the third lot of \$22,000, making a total of \$95,000. There is yet a large part of the flume to be cleaned up, the result of which we will probably give in our next.

THE mucilage used by the government for postage stamps is composed of dextrin two ounces, acetic acid one ounce, water five ounces, alcohol one ounce.

Rapid Increase of Narrow Gauge Railroads.

Very few general readers, we opine, have any adequate idea of the extent which the narrow gauge railroad question is assuming in the United States. The following facts in this direction, confined exclusively to the single State of Ohio, will be read with interest. They have been carefully compiled by the *American Manufacturer*, from which journal we condense:

Dayton and Southeastern, 105 miles. Contract given out and work commenced at \$6,500 per mile.

Springfield, Jackson and Pomeroy, 121 miles. Contract given; to be ready for 15 miles and iron by May 1st, 1876, at \$11,400 per mile.

Wheeling and Lake Erie; graded part way for a standard gauge, but changed to narrow because they could not raise money to build the standard. The road, equipped and finished for a large business, \$13,000 per mile. Road 199 miles long.

Wheeling, Alliance and Lake Erie; part graded; will be over 100 miles in length.

Toledo, Meumee and Grand Rapids; 23½ miles long, 7½ miles finished and running on it. The 7½ miles cost equipped, with rolling stock, about \$8,000 per mile. It was not expected this road would pay for several years, but it paid big from the very first, and now no one can buy the stock at any price reasonable.

The Toledo and Ohio; a short road running from Minerva, Ohio, to Carrollton, and is to be extended.

Toledo and Ann Arbor; 70 miles long; graded for a standard gauge; now being finished for a narrow gauge.

Beilaire and Southwest; grading is now going on; length over 100 miles.

Cleveland, Collamer and Lake View is now standard gauge; going to change to narrow gauge; acknowledge their mistake and say they are out over \$25,000 cash by using "dummies" and not making it narrow gauge at first. Road is 7½ miles long.

The Miami Valley narrow gauge will be 120 miles long; now being surveyed.

Cincinnati and Westward narrow gauge; iron partly laid and locomotive running; 4½ miles long.

College Hill narrow gauge; iron partly laid; locomotive running.

Smithfield and Rush Run narrow gauge is just starting; will be 8 miles long.

Lebanon and Cincinnati narrow gauge is just starting; length about 20 miles.

Toledo and Petersburg narrow gauge; 20 miles long; nearly ready for iron.

J. M. Cook, Toledo, Ohio, has a project about completed to build a narrow gauge from South Haven, Mich., to Toledo, via Paw Paw and Ottawa, Mich. Will be 40 or 50 miles in Ohio.

These are all in Ohio, or partly so, and together over 800 miles of narrow gauge is now being built.

The average cost of Ohio standard gauge roads, now running, is over \$60,000 per mile, while you can build narrow gauge roads for one-fourth that amount, completely equipped, and can haul ton for ton of paying load at the same rate of speed and 15 per cent. less cost of operating.

The above facts present a significant intimation of the rapidity with which this new method of cheapening travel and transportation is rising in public favor, recommended as it is by a relative cost, compared with the standard gauge, so low as to bring its lines within the reach of every well settled neighborhood in the country.

Acetylene Copper.

The explosive character of acetylene copper is well known. Many serious accidents have occurred from its presence—spontaneously formed—on copper pipes employed for conveying illuminating gas. Such accidents have resulted from slight blows with a hammer or some other iron tool given by workmen when engaged in making repairs, etc. Such accidents have become so frequent of late, and are so violent, dangerous and unexpected in their occurrence, that a more general knowledge of this dangerous explosive should obtain, among workmen and others, who, from their calling, are exposed to its danger.

The knowledge of the explosive character of this compound has recently led to the preparation of a similar compound, for practical use in filling percussion caps, torpedoes, etc.

The mode of producing this new compound or salts of copper is as follows: To a solution of sulphate of copper is added enough hyposulphite of soda, in solution, entirely to destroy the blue color. To another portion of the blue vitriol solution, ammonia is added, until the blue precipitate, at first formed, dissolves to a dark blue solution. The two solutions are now mixed; and after long standing a violet colored salt crystallizes out of the beautiful blue liquor. It is this salt which becomes explosive when mixed with chlorate of potash. The composition of the "violet colored salt," above referred to, and which constitutes the new explosive, is not given by the authority quoted; neither is any reference made to the probable cause of its explosive nature. It may possibly be due to the nitrogen imparted to it by the ammonia.

AMERICAN HARDWARE IN ENGLAND.—The *Ironmonger* for February says an American merchant is in Sheffield with a consignment of light steel hay forks, shovels, spades, etc., of an American make, and he is offering them at quotations much under Sheffield prices for similar goods. Such goods of American make have long had a market in England.

USEFUL INFORMATION.

How to Use Leather Belting.

A practical correspondent writes to the *Scientific American* some suggestions concerning the use of leather belting: Leather belts should be thoroughly oiled before using. A good way to apply the oil, where there is much belting to be oiled, is to have the belting run off from one reel to another, through a pot of oil, with suitable rubbers to wipe off the superabundance of oil. Another good method of applying the oil—and perhaps it would be preferable in a majority of cases—is to put it on with a paint brush. This should be done on both sides, with no sparing hand. A belt thus oiled will not require a second application under ten years, unless there be much dust to absorb the oil, and then it may be put on very sparingly compared with the first application. The advantages that an oiled belt has over a dry one are these: 1. It lasts longer. 2. It requires less power to drive the machinery. 3. It may be run much more sleek, which makes the bearings less liable to heat, requiring less oil and less attention.

There are but few people who pay any attention as to how they put on a cross belt, consequently they are just as likely to get it on wrong as right. There are but two ways to put such belts on. The right way is this: Put the belt on in such a manner that the drive pulley will have a tendency to rough up the splices; then when the splices come to the crossing they will smooth each other down instead of catching under each other's corners and tearing open a splice.

A quarter twist belt should never be used where it can be avoided; but when it is used, it should be as narrow as practicable, and the pulleys should be large. Increasing the width of a quarter twist belt does not increase its power in the same ratio as in a straight or cross belt. There is not more than one per cent. advantage in using an oiled belt with the grain side next to the pulley, which will hardly compensate for the ugly look which a belt presents when put on in that manner.

In lacing a belt, the lacing should never be crossed on either side. To lace a belt in this manner, there must be one more hole in one end than the other, consequently there will be a hole in the middle of one end, which is the place of beginning. Draw the lacing to its middle through this hole, lace each way to the edge and back to the middle again, and you have by far the nicest joint that can be put into a belt. No one will ever lace the old way after once getting "the hang" of this method.

BLACK VARNISH FOR IRON.—A durable black and shining varnish for iron is made by adding to oil of turpentine strong sulphuric acid, drop by drop, stirring until a sirupy precipitate is formed, and no more of it is produced on further addition of a drop of acid. The liquid is now repeatedly washed with water, until the water exhibits no more acid reaction. The precipitate is next brought upon a cloth filter, and after all the water has run off, the sirupy mass is fit for use. This is painted over the iron with a brush, being previously diluted with oil of turpentine, in case it does not flow well. Immediately afterward, the paint is burnt in by a gentle heat, and, after cooling, the black surface is rubbed with a piece of woollen stuff dipped in linseed oil. This varnish is said to combine chemically with the metal, and does not wear or peel off.

TO MAKE PUTTY.—Pulverize the required quantity of whiting, which has been specially dried, and pass through a sieve of 45 holes to the square inch; mix the powder with as much raw linseed oil as will form it into a stiff paste, which should be well kneaded and left for a day or so; it must then be worked up, a small quantity at a time, so that it may be rendered quite smooth, and that balls of the dry whiting powder may not be imprisoned in different parts of the putty, for these would make their appearance when the putty was being used, and would, of course, injure the adhesiveness of the composition. Putty should be kept in an earthenware pan covered with a wet cloth. Putty which has become hardened may be made again fit for use by warming and beating it up, and kneading it whilst in that condition.

STRAIGHTENING AND BENDING PIPES.—In order to straighten lead pipe, if the bore of the pipe is one inch or more in diameter, dress out a wooden rod small enough to enter a hole the size of the bore; then point one end, grease the surface thoroughly, and work and drive the rod into the pipe. Draw the rod back and turn it a trifle at every blow. If the pipe is small, less than one inch in diameter, drive in a pointed iron rod, turning it at every blow, so that the rod may not stick so tightly that it cannot be withdrawn. To bend a lead pipe without forming kinks, fill the bore with dry sand. To bend an iron pipe, fill the bore with dry sand, stop the end with stiff clay, heat the pipe where it is desirable to have the curve, and the pipe will bend readily without making kinks. If the dry sand will not run out, water will wash it out.

A SIMPLE BROWN DYE for cloth is made of japonica, half a pound; bichromate of potash, two ounces; alum, one ounce, and water, five gallons. Put the ingredients in a vessel, dissolve, immerse the goods, previously wet with warm water, and simmer for three hours.

Fraud in Graham Flour.

Because Graham flour is recommended as a very healthy article of food, it should not be assumed that all Graham flour is equally good or even nutritious. The fact is Graham flour is rapidly coming to be as much an article of suspicion as ground coffee or spices or any other of the thousand and one adulterations that are daily practiced. The commonest form in which Graham flour is seen is that made from a medium or poor class wheat, and while not properly adulterated, it may be justly characterized as swindling of the meanest kind, for the reason that the product is largely used by dyspeptics and others in imperfect health. The miller who palms off on his customers Graham flour made from anything save the choicest of wheat is one of the meanest of all villains, and if he is not aware of it should be told so. Graham flour properly made is nearly as costly an article as bolted flour ground from the same wheat, and, therefore, when you are offered Graham at much less than the best bolted flour you are being victimized; it is either adulterated or it is made from inferior wheat. A common form of adulteration, and one that is practiced by at least one retail flour dealer in this city, is to take a barrel of flour costing about five dollars, add to it about 60 pounds of bran, 25 pounds middlings, and the same quantity of corn meal. The result of the mixture is 306 pounds of stuff costing about \$6.45, or a fraction over two cents a pound; while Graham flour made from the best wheat cannot be sold now at less than three and a half to four cents a pound. And yet this vile stuff is being swallowed by people in search of better health, when they would do about as well on a diet of hot white biscuit. There is a fortune in store for the miller here in St. Louis who will make a strictly pure article of Graham flour from the best winter wheat, from which the outer husk of the bran shall have been removed before grinding. That man will establish a good reputation, make money, and confer a blessing upon thousands of his fellows. —*St. Louis Trade Journal.*

HARDENED PAPER.—Recent French journals speak of a method of rendering paper extremely hard and tenacious, by subjecting the pulp to the action of chloride of zinc. After it has been treated with the chloride it is submitted to a strong pressure, thereafter becoming as hard as wood and as tough as leather. The hardness varies according to the strength of the metallic solution. The material thus produced can be easily colored. It may be employed in covering floors with advantage, and may be made to replace leather in the manufacture of coarse shoes, and is a good material for whip handles, the mounting of saws, hammers, combs, and other articles of various descriptions. An excellent use for it is in large sheets for roofing. Paper already manufactured acquires the same consistency when plunged, unsized, in a solution of chloride.

ALCOHOL AS A FOOD PRESERVER.—A Swiss professor of chemistry has patented a new process for the preservation of meat, fish, vegetables, butter and cream, the novelty of which consists in the addition of alcohol to the usual solution of salt. The only probable objection to the method is the hardening of the fiber of the meat. One advantage would be the combining of meat and drink, as is done by the London water companies, and the mixture might suit weak-backed teetotallers. For preserving butter, the professor mixes 2 lbs. alcohol of 90 degs. strength, with every 100 lbs. of dairy produce.

A SIMPLE way of cutting glass is to crack it with a very fine, needle-like gas flame. Start the crack with a file, and then apply the flame, which may be produced through a minute perforation in a glass connected with some rubber piping so as to allow of the flame being conveniently carried from point to point. The crack will run before the flame in any desired direction.

Wax flowers, if left out in the drizzling rain, will be thoroughly cleaned in a short time.

GOOD HEALTH.

Candy.

So much has been written about the relations of candy to health, and particularly to diseased teeth, that it would seem presumptuous to add even a word. But supposing the question cannot be settled at once, there are some facts about candy, or sugar rather, which I have not seen mentioned. As a food, it is a failure. The chemist tells that cane sugar contains three elements. The human body has some fourteen elements. How can three elements make fourteen? Dogs fed on sugar died in 40 days. Their eyes ulcerated and came out. Dogs fed on nothing lived just as long. The system has a natural loathing for food containing nothing but sugar. We pass then to the occasional use of sugar. Does it affect the condition of the organs of the body? Several years ago Dr. S. Weir Mitchell, of Philadelphia, proved that he could produce cataract of both eyes in half an hour, by simply injecting a teaspoonful of a saturated solution of sugar beneath the skin of a frog or Guinea pig. Dr. B.

W. Richardson, of Loudon, has confirmed this, and these results are received by the medical profession as satisfactory. Now if a teaspoonful of sugar solution will make a frog or Guinea pig totally blind in half an hour, can sugar be regarded as an innocent substance for young and growing persons, especially when they diet so largely upon white flour, which is chiefly composed of starch, whose chemical formula is identical with that of sugar? According to Dr. C. B. Agnew, of New York, out of 1,000 children under 18 years of age, in a large school in his vicinity, 703 were found with defective organs of vision when examined with the ophthalmoscope. Have we a right to infer that sugar and starch diet have anything to do with this large percentage of deficient eyes? The experiments quoted show that sugar does act promptly, quickly, and terribly upon the substance of the crystalline lens of lower animals. Can we deny the probability of its action upon the eyes of human beings? Mark, we do not say it does thus act. We simply raise the question. We wish the State board of health would have it investigated, as it is a matter germane to their invaluable department of labor.

Now for candy and diseased teeth. Lime and phosphorus form the chief mineral ingredients of teeth. The organic matter (i. e. that like sugar) amounts roughly to about 20 per cent. of the whole tooth. The mineral matter and water make the remaining 80 per cent. In other words, sugar gives the teeth, under the most favorable construction, 20 per cent. of its food only, when it is used as an aliment. But sugar cannot be used as an exclusive aliment, as death would ensue. Used occasionally when the other food has its normal amount of mineral ingredients, candy, when pure, probably does not harm the teeth. But used frequently, in connection with flour diet, there is no doubt that it will promote the decay of teeth. When organized substances are fed, they must receive all the elements that enter into their composition. Failing to receive these, their vitality is impaired and decay results. Teeth fed with candy do not receive any mineral elements. No phosphorus and no lime are found in candy, but they constitute the main part of teeth. Hence we see that candy and teeth are not interchangeable things, and that candy-eaters must not be surprised if their teeth fail. —*Journal of Chemistry.*

Dangers of the Shop.

We give in what follows an abstract of an instructive lecture lately delivered before the Society of Arts, by Dr. B. W. Richardson, on "Industrial Pathology; or, the Influence of certain Injurious Occupations on Health and Life." There are, said the lecturer, seven active causes producing disease amongst the working classes—first, noxious inhalation of dust and gases; second, exposure to soluble chemical substances; third, mechanical impact of foreign bodies; fourth, physical injuries from unnatural postures, etc.; fifth, exposure to damp or impure air; sixth, contact with organic parasitic forms; and seventh, excess of muscular work, etc. Turning his attention in the first instance to the injury caused by the inhalation of various sorts of dust, Dr. Richardson alluded to the growth of oidium on the vine, which growth was checked by the blowing of sulphur dust on the plant. Oidium was described as a white parasitic fungus, which appeared not only on the vine, but also in the throats of persons suffering from diphtheria. Ammonia often proved injurious to haters. The vapor of turpentine produced a specific form of disease, and was more injurious to house painters than the lead to which their peculiar complaints were commonly attributed. Sulphide of carbon was useful as an anæsthetic agent, but produced disease and insanity when inhaled for any time by men who used it in their occupations. The fumes of nitric acid affected farmers deleteriously. The vapor of chlorine affected bleachers injuriously at first, but on continued use became innocuous. Aniline produced two distinct forms of disease—one neuralgia, the other ulceration, and when the inhalation resulted in death, the flesh was found to be of an aniline or mauve color. Nitro-benzene vapor produced headache, and the vapors of metals caused various diseases of the lungs, brain and stomach.

The remainder of the lecture went to show that apoplexy, paralysis, insanity and various other serious diseases, were producible in artisans by contact with injurious substances and vapors, especially that of lead, which affected not only the workman using it, but his offspring. Cleanliness and care, the speaker affirmed, would greatly mitigate this mischief, but still the startling fact remains, that among those workmen who were exposed to the vapors of lead, the deaths were 38 per cent. in excess of ordinary mortality. Dr. Richardson had no radical remedies to suggest for the majority of his illustrations, and contradictory as it may appear, it is unfortunately true, that it would have made no sensible difference had he done so, on the principle possibly that familiarity with danger breeds indifference to, or contempt of it, experience has demonstrated that, as a class, no reforms are more difficult to introduce than remedial measures of this character.

PERFECT SLEEP.—The sleep of perfect rest is dreamless—a kind of sleep not produced by laudanum, chloral or any other drug. Remember this, young people, at the beginning of your lives. Do healthy work enough to weary you, and you will sleep a healthy sleep, and be doubly sure of a good old age.

DOMESTIC ECONOMY.

How Vienna Bread is Made.

Prof. Horsford was one of the United States scientific commission to Vienna at the world's fair of 1873. He has made a report concerning the famous Vienna bread, which has been issued from the Government printing office. He describes the Viennese bread as follows: "It is a smooth, irregularly rounded small wheaten loaf, of uniform weight. It presents a rich reddish brown crust and a delicately shaded yellow, almost white, interior. It is always light, evenly porous, free from acidity in taste or aroma, faintly sweet, without the addition of saccharine matter to the flour or dough, slightly and pleasantly fragrant, palatable without butter or any form of condiment and never cloying upon the appetite." Good fresh middlings flour, Prof. Horsford says, would compare favorably with the average Hungarian flour used in Vienna. The next requirement is fresh pressed yeast. This is already made in the United States. It is not difficult to manufacture, since it is made by skimming the froth from beer mash in active fermentation.

Next follows the very important operation of mixing. Into the middle of a zinc-lined trough, about two and a half feet wide and eight feet long, semicylindrical in form, the Vienna baker empties his flour sacks. Then into a pail holding about five gallons, equal parts of milk and water are poured and left to stand until the mixture attains the temperature of the room, between 70 and 80 degs. Fah. It is then poured into one end of the trough and mixed with the bare hand, with a small portion of the flour to form a thin emulsion. The press yeast is next crumbled finely in the hands and added in the proportion of three and a half ounces to every three quarts of liquid, and then one ounce of salt in same proportion is diffused through the mixture. The trough is now covered and left undisturbed for three-quarters of an hour. Then follows the incorporation of the flour from the neighboring heap; and as this is the last of the ingredients we may write the recipe as a whole, thus: Flour, eight pounds; milk and water, three quarts; pressed yeast, three and a half ounces; salt, one ounce.

The mess of dough, being left quiet for two hours and a half, becomes a smooth, tenacious, puffed mass, of yellowish color, which yields to indentation without rupture and is elastic. It is now weighed into pound masses, and each lump is then cut by machinery into 12 small pieces, each of three-quarters of an inch in thickness. Of each one of these the corners are brought together in the center and pinched to secure them. The lump is reversed and placed on a long dough board for further fermentation, until the whole batch is ready for the oven. Before being introduced into the latter the rolls are again reversed and restored to their original position, having considerably increased in volume, to be still further enlarged in the oven to at least twice the volume of the original dough. In the oven they do not touch each other, and the baking occupies about 15 minutes. To glaze the surface they are touched in the process of baking with a sponge dipped in milk, which, besides imparting to them a smooth surface, increases the brilliancy of the slightly reddish cinnamon color and adds to the grateful aroma of the crust. No peculiar form of oven is required, the only necessary point being that the receptacle shall be capable of maintaining a temperature of about 500 degs. Fah.

French Cookery.

Meats should be selected with a view to the methods of cooking to be adopted. The French never boil meats unless for the purpose of making soups. They regard boiled meats as comparatively worthless and never serve them unless in some prepared form, to restore flavor and lost nutrient principles. We forget in this country that to boil food, be it meat or be it vegetables, is to extract from it, first, its volatile aroma, then its essences or juices, its nutritive power; and these go out into the hot water which is stupidly thrown away. Boiling meat or vegetables in France is to make soup, and so saving are they that even the water in which beans and cauliflower have been boiled is always kept to serve as a basis for vegetable soup. Every liquid which has received the extracted flavor of a boiled substance is looked upon as precious, and is employed again in some form, so as not to waste the properties which it has acquired. The entire system of French cooking, both in form and practice, is to save the whole nutritive elements of every substance, to pass into the stomach, instead of allowing it to be poured down the sink spout or sending it to the pigs. The lesson taught us in this regard should be heeded. Butchers' bones, and those of fowls, which here go to the waste bucket or to the soap boiler, covered with fragments of meat and loaded internally with rich suet, are in France carefully sought for and employed in making soups. Nothing is wasted which can be used for human food. Soups are so common it may be said the nation lives on them. The average earnings of laborers in France do not exceed 30 cents a day, and yet from this pittance they continue to live comfortably. The average of health in the population is much higher than in most countries, and the average length of life is as high as 38 years.



W. B. EWER, SENIOR EDITOR.

DEWEY & CO., Publishers.

A. T. DEWEY, DEO. H. STROMO,
W. B. EWER, JNO. L. ROONEOffice, No. 224 Sansome St., S. E. Corner
of California St., San Francisco.

Subscription and Advertising Rates:

ADVERTISING RATES.—1 week. 1 month. 3 months. 1 year.				
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THE ORIGINAL ARTICLES in this paper are mostly so in solid type, giving in our columns one-third more reading than is contained in ordinary loaded matter.

Our latest forms go to press on Thursday evening.

San Francisco:

Saturday Morning, April 22, 1876.

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Tulloch's Automatic Ore Feeder, F. Ogden, S. F.; Caution to the Public, R. L. S. Ball and R. M. Fryer, Grass Valley, Cal.; Wanted—A Superintendent, Hubb & Luckhardt, S. F.; Paul's Dry Process, A. B. Paul, S. F.; Quartz Mine and Mill for Sale, A. Grummet, Oregon Gulch, Cal.

THE OLD BAY STATE AT THE CENTENNIAL.—Massachusetts will make a novel, interesting and instructive exhibition at the Centennial, which will consist of a selection of models of the varied marine craft which has been employed in her waters since the first settlement of Plymouth colony. The collection will include some 50 or 60 models—all neatly and some most elaborately executed, and all perfect in type. The contributions are generally from the most noted ship owners and ship builders of the State, and represent every stage of progress in the art, from the Indian birch canoes and first fishing boats used on the coast, up to the most improved modern iron-clad. The paper boat in which Mr. Bishop made his famous trip from the Gulf of St. Lawrence to the Gulf of Mexico, will also have a place in the collection.

INTERESTING MINERALS.—Mr. S. S. Taylor, of Spanish Ranch, has sent us two mineral specimens for a name. We submitted both to Prof. H. G. Hanks, of the State University, for examination, who pronounces the greenish mineral to be a very beautiful variety of "idocrase," and valuable as a gem. The dark specimen is "psilomelane," an oxide of manganese, generally hygroscopic. This mineral is quite common near San Francisco, and is abundant at Red Rock.

Deep Mining Shafts in Europe.

Twenty years ago the deepest mining shafts in the world reached only about 2,000 feet below the surface. The very deepest, we believe, was a metalliferous mine in Hanover, which had been carried down to the depth of 2,290 feet. The deepest perpendicular shaft to-day is the Adalbert shaft in a silver-lead mine in Prizibram, in Bohemia, which in May last had reached a depth of 1,000 metres—3,280 feet. The attainment of that depth was made the occasion of three days' festival, and still further noticed by the striking off of a large number of commemorative silver medals, of the value of a florin each. There is no record of the beginning of work on this mine, although its written history goes back to 1527. Quite recently an elegant commemorative volume has also been written and printed, which an English paper before us says is "most interesting to those who have a taste for either the actualities or the antiquities of mining industry."

There are two other localities, however, where a greater depth has been reached than at the Adalbert shaft, but not in a perpendicular line. These are, first, the Rocksalt bore hole, near Spereberg, not far from Berlin, which a few years ago had been bored to a depth of 4,175 feet; and, secondly, the coal mine of Viviers Reums, in Belgium, where the miners, by shaft sinking, together with boring, have reached a total depth of 3,542 feet. Turning from these two mines, no shaft, in unbroken perpendicular line has, as yet, exceeded the depth of 3,280 feet. Taking each singly the deepest shafts in the world, at the present moment, group themselves according to the following order:

1. The already mentioned Adalbert shaft, 3,280 feet deep. As the top of this shaft is 1,732 feet above the sea level, the bottom is, of course, 1,548 feet below it.

2. Two shafts near Gilly, in Belgium, are sunk to the depth of 2,847 feet. At this depth they were both connected by a horizontal drift, from there an exploring shaft is sunk to a further depth of 666 feet, and from there again a trial bore, 49 feet in depth, is put down, so that the total depth reached is 3,542 feet. As they did not, in the bore hole, discover the sought-for coal seam, they have returned to the shaft at the 2,847-foot level.

3. The Eimgkerts shaft of the Lugauner coal mining company, Rhenania, Lugaun, in the kingdom of Saxony, is 2,653 feet deep.

4. The Sampson shaft of the Oberhartz lead and silver mining works, near St. Andreasberg, Hanover, has a depth of 2,437 feet, is at present the deepest shaft of Prussian mining.

5. The winding shaft of the Rosebridge colliery, near Wigan, Lancashire, England, has a depth of 2,458 feet. Coal is drawn from the "banging on" at the 2,418-foot level; the time of the cage running this distance being 55 seconds; the winding rope has, therefore, an average speed of 44 feet per second.

6. A shaft at the coal mines of St. Luke, near St. Chamont, in the Loire department, France, reaches 2,253 feet.

7. The shaft of the Dunkirk colliery, near Dukinfield, Lancashire, is 2,069 feet deep, but the mining is prosecuted to a further depth of 755 feet by shafts from the lower levels, making a total depth of the mine of 2,824 feet.

8. The deepest shaft of the collieries near Ronchamp, in France, is 1,891 feet. A similar depth has been reached by the argentiferous mine near Kongsberg, in Norway. The mines belonging to the Roros copper works, in Norway, have worked to the depth of from 2,540 to 4,270 feet.

9. The Amalia shaft in the mine works near Schemnitz, in Hungary, 1,782 feet.

10. The No. 1 Camphausen shaft, near Fishbach, in the department of the Saarbrück collieries, has now reached the depth of 1,650 feet and may possibly become the deepest shaft in Prussian coal mining.

Although the depths to which the shafts enumerated have penetrated into the interior of the earth in the art and practice of mining may appear mighty, and may be an expressive witness of the great progress made in mining pursuits; yet, on the other hand, the above results may be considered insignificantly small when we compare them with the extent of the earth's crust and the diameter of the earth.

The deepest bore hole in the world is the artesian spring at Potsdam, in Missouri, which reaches a depth of 5,500 feet.

THE MISSISSIPPI'S MOUTH.—Capt. Eads has made application for the first payment on his work at the mouth of the Mississippi, which was to become due when there were 20 feet of water on the bar. This depth he believes will be reached in a few days, and the full depth of 30 feet will be secured by the latter part of next summer. It may be remarked that there still remain some disbelievers in the practical value of this deepening of the mouth of the Mississippi. It is held by such that as the channel deepens the mud which is thus removed will only be carried a little farther out, and be again deposited so near the jetty as to form a mud bar, out to which the work will have to be carried, and so on *ad infinitum*. But some people never will be convinced of anything.

Mining Machinery Improvements.

Experience has shown that working on narrow margins of profit is to be the condition of the future. Economy of production is of more importance than the first cost of the raw material—hence the increased attention that is being paid to the introduction of improved machinery and other appliances. Competition is constantly decreasing the already narrow profits which have for some time existed, and the fullest employment of labor-saving machinery is the only road to profitable production. We find this condition of things existing in every department of industry, and he who ignores it does so at his peril. Our Patent Office reports and industrial newspapers are filled with illustrations of new and improved machinery, all having in view the saving of hand labor and the cheapening of production.

The great industry of mining, in which our own State is so much interested, is no exception to the rule, but on the contrary shares largely in the benefits derived from such improvements. The improved automatic ore feeder illustrated in another column is a case in point. Improved blasting powders, which largely reduce the labor attendant upon drilling, and improved rock drills, have greatly reduced the cost of mining and rendered many mines valuable which a few years ago could not be worked to a profit. Perhaps no department connected with mining has been so largely improved within the last 10 or 15 years as that of drilling and blasting. Machine drills are now manufactured in large numbers, both in America and Europe, and sent to all parts of the world.

In coal mining machines have long been in use that will cut a thin channel or groove in the coal, so that it may be removed in larger quantities and with less waste in coal, time and labor than can be done with the pick or blact, and by which great economy has been introduced in that important branch of mining. And now we hear that that principle has been adapted to vertical as well as horizontal work, and successfully applied to the sinking of shafts and wells, either in picking earth or solid rock. This work is accomplished in the following manner:

A circular track, somewhat less in diameter than the intended shaft, is laid, and on this the cutting machine travels, and cuts a ring about 1½ inches wide and 20° deep, in the soil, rock, or other material. A hole sunk by a drill in the center is then charged, and on removing the outer to a safe distance a blast is fired in the middle of the core. The blast shatters the core but does not injure the sides of the annular cut. In hard rock the annular cut leaves a good surface for the interior of the shaft, and in softer rocks or soil, timber or masonry is readily added.

MINING THE GREAT CIVILIZER.—The London Mining World discourses on the effects of mining on civilization at considerable length, and very legitimately concludes as follows: "It is not too much to say that all the civilization of which we boast may be traced to the application of the metals and the use of coal. Wherever nations have learned to mine and work metals, they have become powerful and rich, subduing their neighbors either by force of arms or by greater industrial activity, and in either case acquiring their wealth. In the earlier stages those who possessed the metals made an easy prey of their rivals, and in the present day, nations mining their coals and metals do in a better and more elevated sense outstrip their competitors and become the masters of the world. All history teaches that those nations which learned to mine and work metals became wealthy, powerful and civilized, whilst those which had no mining industries or no metallic manufactures have remained in a state of barbarism, and that such at the present day is the distinguishing feature of savages. Mining industry is indeed the foundation of all civilization, and the chief basis on which all industries must rest, as well as being at the same time the principal element of progress. Without it the working class could gain little beyond the mere necessities, and as we have often shown that coal and iron are the first requisites of national prosperity, so it is to mining that we must refer the advancement of the present age."

GOLD IN INDIA.—The Madras newspapers have recently given some accounts of the Colar gold fields, in Mysore, and of the operations which have just been commenced there by the Ooregam gold mining company. The auriferous quartz reefs are said to extend for a distance of nearly 20 miles, and are only about 12 miles from a station on the Madras railway. The company has already sunk one main and two auxiliary shafts, the former of which is expected to cut the reef at about 60 feet. The works have been so recently begun that it is not yet possible to form any accurate idea as to the probable results, but it seems to be thought that the field is one of great richness; moreover, it has a history which is said to go as far back as the year 1293, when Allagene, a general in the service of the Emperor of Delhi, returned from an invasion of Mysore, bringing with him a large amount of gold. Hyder Ali and Tippoo Sahib would also appear to have worked the mines. Should it turn out that the reefs can be profitably worked, the facts that they are situated at an elevation of 3,800 feet, and that the climate is good, will doubtless tempt many Europeans to try their fortunes there.

Successful Frost Fighting.

Last week we noted the French method of guarding against the fruit destroying frosts of springtime, and mentioned several cases of the application of the practice in this State. We have now information of success with the frost fighting fires in the foothills. The Amador Ledger says: "Wm. Avala, who owns perhaps the largest orchard around here, has this year adopted the plan of keeping fires burning on the windward side, the wind carrying the smoke and heated air over the trees, and preventing the formation of frost. On Monday morning we were favored with a nipping frost, which we are informed has inflicted serious damage upon the fruit. Avala that morning had 120 fires burning on his garden of 50 acres, and he reports his fruit uninjured. The cost of the experiment is inconsiderable. It is rarely necessary to light up more than three or four times in a season, and the cuttings from the vines and trees are about sufficient for the purpose. He calculates that this simple precautionary measure will save him something like \$1,000."

The importance of this safeguard against loss by frost is vital to our fruit interest in many parts of the State. The cost of saving the fruit cannot be compared with loss which is occasioned when it is ruined. It is of special value that the remedy is so cheap and so easily applied. We trust that our fruit-growing readers in exposed situations will save up their rubbish during the coming season and be prepared to give the frost a warm reception next spring. There is money in saving a crop just at a time when negligent husbandmen are cropless.

Reducing Our Iron Imports.

The great and rapid reduction which is being effected in our imports, and the consequent decrease in the necessity of specie exports to meet foreign balances, must soon exert a most favorable influence upon the general industrial interests of the country, and will, eventually, once more bring about the era of "good times." So marked and important is that change in our foreign trade that such a result cannot be much longer delayed. But in no department of industry is this change being more rapidly developed than in the iron trade.

During the first two months of 1874, our imports of railway iron were 16,978 tons; during the same period in 1875, they were 4,981 tons, and during the first two months of the present year this import was just 54 tons! In 1864 we imported steel rails at a cost of \$150 per ton. To-day we are making those same rails at a cost of only \$61 to the ton. No wonder the British iron men are despondent. They have lost their best customer, and even the miscellaneous iron manufacturers of Sheffield confess that they have next to no orders on their books from the United States. We have fairly turned our back upon Johnny Bull, the natural outcome of which will be increased work for our own mechanics and better times for all.

NEW SUBSTITUTE FOR GOLD.—The following is a new metallic alloy which is now very extensively used in France as a substitute for gold: Pure copper, 100 parts; zinc, or preferably tin, 17 parts; magnesia, 6 parts; sal-ammoniac, 3.6 parts; quicklime, 1.8 parts; tartar of commerce, 9 parts; are mixed as follows: The copper is first melted, then magnesia, sal-ammoniac, lime and tartar are added separately and by degrees, in form of powder. The whole is next stirred briskly for about half-an-hour so as to mix thoroughly, after which the zinc is added in small grains by throwing it on the surface and stirring it till it is entirely fused. On this being done the crucible is then covered and the fusion maintained for about 35 minutes, after which the surface is skimmed and the alloy is ready for casting. This alloy has a fine grain, is malleable, and takes a splendid polish. It does not corrode readily, and for many purposes is an excellent substitute for gold.

THE PAYING OUT OF SILVER COIN for the redemption of fractional currency has been commenced. Redemptions are made at the office of the Treasurer of the United States at Washington, Assistant Treasurers at Boston, New York, Philadelphia, St. Louis, Charleston, New Orleans, Cincinnati, Chicago, San Francisco and Baltimore, and at the United States depositories at Buffalo and Pittsburgh. Fractional currency sent by express or otherwise to the offices named, for redemption, should be accompanied by a letter of advice, stating fully the address of the sender and how remittance in payment therefor is desired; and if by Treasurer's check, the office at which the check should be made payable. The Government will not pay express charges on silver issued or fractional currency presented for redemption.

Those merchants and other business men who want to sail smoothly should use a little printer's ink. It is the best specific we know of, and our columns constantly show that the best and shrewdest men use this popular remedy to "keep things moving." A few dollars paid out in judicious advertising has in a thousand instances enabled business men to ride over a storm and reach a safe harbor. To sit in silence or groan over events, or resolve to do nothing is palpable evidence of folly or weakness, or both.—Ex.

Gems and Precious Stones.

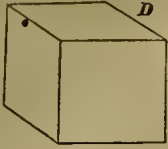
[Written for the Press by HENRY G. HANES.]

(Continued from last week.)

I have already stated that the diamond generally crystallizes in octahedrons or dodecahedrons, rarely in cubes. To show that these forms are based on the same system I would suggest to the reader that he make a few simple experiments as an illustration.

On consulting works on crystallography it will be found stated that the cubic system is also called the isometric system, and that there are three axes, rectangular and equal.

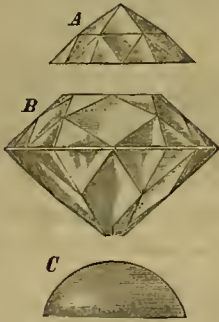
To understand this take a raw potato and cut out a cube, as shown in the engraving, D. In



the center of each face make a point, and from the top face run a pin down through the cube; let this be called the vertical axis. Now if two other pins are pushed through the other faces to represent axes, it will be seen that there are three and that they are of equal length (if the cube is perfect). It will also be seen that all the angles are right angles. Now draw a line parallel to the table through the four centers of the side faces of the cube and cut from the center of the upper face to these lines; then reverse the model and treat the lower half in the same manner. A perfect octahedron will be produced, represented by the engraving E. I might show that the dodecahedron is also a modification of the cube, but it will not be necessary.



The cutting of the diamond is based on this crystalline form. There are three modes of cutting the diamond, as shown in the engraving.



The shape of the rough stone and the taste or want of taste of the owner determines which style shall be adopted. The rose is shown in A, the brilliant in B, and the cabochon in C.

The art of cutting diamonds by their own powder originated with Louis Berghem, of Bruges, in the year 1476. At first the style was a flat table with facets on the edges. The brilliant was invented during the reign of Louis XII. Cardinal Mazarin is said to have been the first who had diamonds cut in that form. That the reader may know exactly what a brilliant is, I will describe the principles upon which they are made.

Let us return to the octahedron standing as it was cut from the cube; suppose the vertical axis to be divided into 18 parallel lines, as shown in the engraving. The central portion of the crystal, or the horizontal line where the two pyramids join, is called the "girdle." The upper portion of the octahedron is cut off at the 5th line, leaving the flat surface A, which is the "table;" one-eighth of the bottom is then cut off, leaving a small face called the "culet." The remainder of the crystal is a perfect square brilliant. The edges and corners are then cut and polished and the finished brilliant, B, is the result. Any deviation from this will make a badly shaped stone. The value of a gem is also based on the same rule, for a diamond is worth only what a perfect brilliant would be which can be cut from it. Sometimes to make a diamond appear larger the angle of the crystal is made greater than 90 degrees. Such a stone, wanting in depth, is deficient in brilliancy, although appearing larger than a perfectly proportioned stone. Such diamonds are called "spread brilliants." In other cases for certain reasons the angle is less than 90 degrees. The table is then smaller than it should be, and is unsatisfactory to the educated eye.



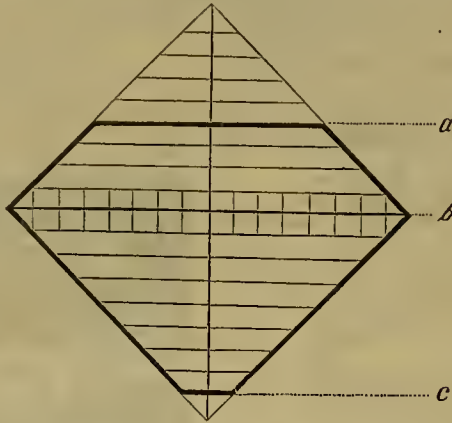
David Jeffries, who wrote a work on diamonds and pearls, published in London in 1750, and from whose book I have taken the above rule for cutting the true brilliant, gives drawings of brilliants from one carat to 100 carats, increasing by eighth of a carat. Under each model

is a small bar showing the proper depth from the table to culet, and below the bar the size of the culet. The table is used as follows: Suppose the reader has a diamond which weighs four and one-eighth carats, and wishes to ascertain if it has been properly cut: With a pair of small calipers he takes the width of his diamond and compares it with the model of a brilliant of the same weight in the table. Then with the calipers he takes the thickness of the stone, from table to culet, and compares it with the bar below the model. Lastly, he measures the size of the culet; if the diamond is badly cut the defect will be seen at once. These tables have been copied ever since, and may be found in any work on diamonds and precious stones.

The engraving at the bottom of the other column shows a few of these models.

Metallic Railway Cars.

The question of substituting metal instead of wood in the construction of railway cars is not a new idea. We have several times alluded to



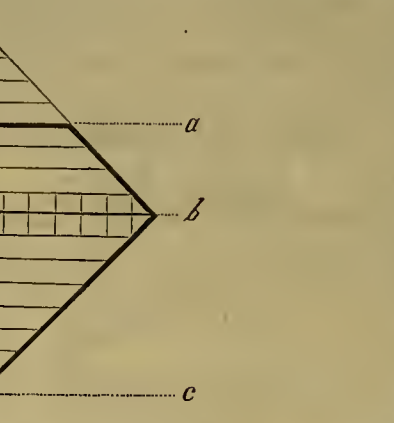
METHOD OF CUTTING THE BRILLIANT.

to it in our columns. Metallic cars have been built both in this country and in Europe; but, as heretofore constructed, their advantages, when compared to wooden ones, have been considered of so doubtful a character, that they have been generally condemned, for being too heavy, hot and cold, too noisy and expensive, and incapable of being readily repaired.

Profiting by the experience of the past, a company at Providence, R. I., as we understand, has lately undertaken the practical solution of the problem of metallic cars, both for

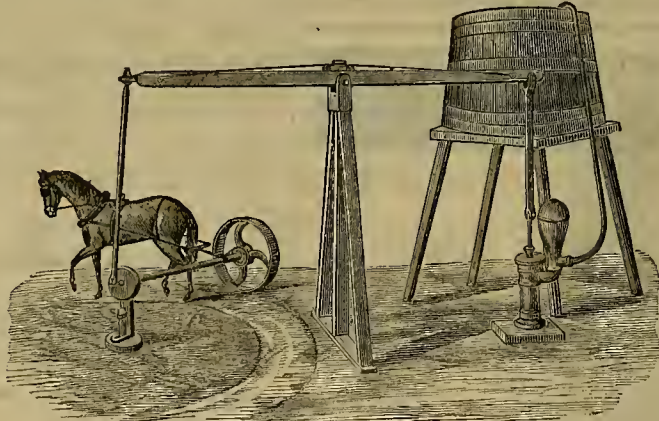
We understand that one of these cars will arrive soon in this city with a load, all the way through from New York, when it will be subjected to the free inspection of our railroad men and mechanics on the Pacific coast, and will probably be put to active use to further test its qualities. Several of these cars have lately been placed upon one of the roads out of Worcester, Mass., where we understand they are doing good and satisfactory service. We shall probably have occasion to make further references to these metallic cars after the opportunity has been offered for personal inspection, as promised above.

REMARKABLE DISAPPEARANCE OF LAKES.—Reports from Lowndes county, Georgia, speak of the recent sudden disappearance of several lakes in that county. There are a large number of lakes there, from 10 to 500 and 1,000 acres in area. In September last one dried up or ran off, and left many barrels of fish in holes of water about upon the bottom of the lake. In January another, about five miles from this, did the same thing, and subsequently Grassy pond, a lake covering



HORSE-POWER FOR OPERATING PUMPS.

about 500 acres, between the two above mentioned, left its millions of fishes out of water. The waters of this lake sank gradually out of sight, during a period of three weeks. As soon as the waters were low enough for the use of scoop nets, hundreds of people gathered about and gathered the fish by cart loads; and when it had all disappeared millions were left dead upon the ground, from which they were carted off for manure. The waters, at latest accounts, were again returning into the beds of the lakes. "What's the matter?" is the question universally asked, and as yet without an answer, as the like was never known there



before, and the season precludes the possibility of attributing the phenomena to ordinary evaporation.

PACIFIC COAST ORES FOR THE CENTENNIAL.—Mr. John Hatch, an old Californian, left on the overland train for Thursday for the Centennial exposition, with five tons of specimens of the mineral deposits of the Pacific coast and Mexico, collected by him during 12 years of arduous labor. Each specimen is labeled with its appropriate scientific name and the locality from which it has been taken. This collection will be a feature of the exposition, as it will illustrate the richness of the mineral resources of this coast. The collection is valued at about \$50,000.

STILL ANOTHER ASTEROID.—A telegraphic dispatch from Ann Arbor, Michigan, announced that Prof. Watson discovered on the night of the 16th instant, in the constellation Virgo, a planet hitherto unknown, continued observation of which was interrupted by clouds. The next night he observed it satisfactorily. It shines like a star of the 11th magnitude. Its position is, right ascension, 13 hours 29 minutes; declination, 11 degrees 47 minutes south. This is undoubtedly another asteroid.

The Mechanics' Institute Improvements.

The work of improving the library building of the Mechanics' Institute on Post street is now nearly completed. The more noticeable improvements are in the library rooms, which had become inadequate to the demands made upon them, but which will now accommodate any accessions they may receive for some time. The reading room, which was before situated on the same floor with the library, has been removed to the upper floor, next to the chess room, while the quarters it formerly occupied have been connected with the main library room by large folding doors. Shelves with a capacity of more than 5,000 volumes have been built about this room, and upon them are placed a complete edition of the English patent office report, consisting of about 3,000 volumes. These contain a complete history of English invention, from the year 1617, when the British patent office was established, until the present day. It is difficult to estimate in dollars and cents the value of this addition to the library. Only two other libraries in the United States enjoy a similar possession, and the trustees of the Mechanics' Institute are to be congratulated upon their success in obtaining for the use of its members a gift which the British government is usually so chary in bestowing. It is probable that this will be the only work of the kind ever found upon the Pacific coast, for it is nearly out of print, and only personal influence with high officials is able to procure it. These books as now arranged upon the shelves present a fine appearance. They are of uniform size, bound in red half morocco, and with gilt lettering, and, displayed as they are in a well lighted room, give a peculiarly bright appearance to the apartment, and even seem to make the dry details and specifications of the patent poetic. Each volume is furnished with careful drawings of the inventions, with the exception of those since the year 1871, which comprise only the printed descriptions, the plates being contained in larger volumes, which stand upon adjoining shelves for ready reference.

It may be interesting to note that the first recorded English invention was for a plan of engraving and printing maps, granted to Aaron Rathbone and Roger Burges, who received their papers from James I. It is the intention of the trustees to employ this room mainly for the accommodation of Patent Office reports, and those of the United States already upon the shelves. This room, like the one which has long been in use upon the other side of the hall and staircase, is to be used for reference solely, and none of the books it contains are to be taken from it. By the new arrangement the door which formerly connected this room with the hall has been closed up. The ladies' entrance, which was found to be unnecessary, has also been done away with, thus giving a greater width to the room and to the store directly under it on the ground floor. Much advantage has also been gained by removing the reading room to the upper story. By it a greater degree of quiet has been secured, and by a sky-light in the roof and an improved arrangement of gas burners, the eyes of readers, which were sometimes tried in the lower room, are much favored.

On the lower floor the improvement is even more marked. Corinthian hall has been done away with, the floor has been raised several feet, and the three stores remodeled into two and extended back to the end of the building, nearly doubling their capacity and affording them perfect light and ventilation by the windows in the rear. The basement has also been enlarged for the more complete storage of supplies. In short, the building and all its appointments have suffered a thorough overhauling and with very satisfactory results. We copy the above substantially from the *Morning Call*.

A Simple Pumping Power.

We present our readers herewith the illustration of a novel horse power for operating pumps, the invention of Mr. Frank A. Hill, the well known and gentlemanly superintendent of the agricultural machine works and depot at San Leandro, in this State. Mr. Hill is the inventor of the Enreka gang plow, which recently defeated all antagonists at the plowing match at Rio Vista, and he seems determined to supply our farmers with economic, simple and effective machinery for doing all kinds of farm work. And *en passant* we would say that Mr. Hill has secured United States letters patent on the above named inventions—and a great many more—through the MINING AND SCIENTIFIC PRESS Patent Agency. The horse power, it will be seen, consists of a centrally pivoted walking beam, one end of which is connected with the pump rod by a pitman, while the opposite end is connected with a crank wheel by a similar pitman. This crank wheel is secured upon the end of a horizontal shaft, which is supported by a suitable standard near the wheel. The outer end of this shaft has a large traction wheel mounted on it, and the horse is hitched to the shaft near the traction wheel. As the horse travels around in a circular track, the traction wheel rotates and the motion is transmitted through the crank wheel, oscillating beam and pitman to the pump rod. This arrangement is extremely cheap and simple, and cannot help but be effective.

Parties desiring to learn further particulars in relation to this device, can address F. A. Hill, San Leandro, Cal.

Tellurium—How to Make Tests.

A correspondent of the *Lassen Farmer* furnishes that journal with the following information on the above named subject: "In looking over your issue of March 4th, I see a request for some information on the metal tellurium. If you have not already been supplied from some more able source, I send you the following for publication: Tellurium is a metal of a tin-white color, about as hard as rock salt or gypsum, having a specific gravity of 6.1. It is most generally found to contain some iron and gold. It is very rarely found in small columnar crystals; usually it appears as a very fine-grained impregnation. It is easily melted before a blow pipe, when it colors the flame a bluish green, and in evaporating leaves a grayish white sublimate, red edged on the charcoal. It is soluble in nitric acid. Heated in concentrated sulphuric acid it imparts a red color to the acid, which, however, disappears again on greater heating. Should the acid be diluted during the time the red color is present, a grayish black precipitate is produced. The metal is also found in telluric-silver, a mineral of a lead or steel gray color, somewhat ductile, but of a higher specific gravity than the former, easily melted with a blow-pipe to a globule, throwing off a sublimate as above. Another telluric ore is known as sylvanite; this is softer than either of the former, of a steel-gray or silver-white color, and is composed of tellurium, gold and silver. This mineral, when treated with a blow-pipe, on charcoal, gives a dark gray globule and a white sublimate, which globule, on the addition of a little soda, by further blowing, results in a light yellow globule of argentiferous gold, or gold and silver. In nitric acid sylvanite dissolves, with the exception of the gold. In aqua fortis this mineral dissolves and throws down a precipitate of chloride of silver, and in concentrated sulphuric acid, it acts the same as tellurium. Tellurium is likewise found in connection with lead, and bismuth, and antimony.

Curious and Interesting Facts.

A VALUABLE manuscript has been discovered in the Azores. It refers to the colonization, in the year 1500, of the northern part of America by emigrants from Oporto, Aveiro and the island of Terceira. It was written by Francisco de Souza, in 1570, and was lost during the great earthquake of Lisbon, in 1755. This important document is about to be published, and, it is thought, will throw a great light on the disputed question of the early discovery of America.

THE latest contribution to the dispute about spontaneous generation is a letter from Prof. Tyndall to the *London Times*, in reply to Bastian, wherein the former says: "Many of my infusions, prepared with the most scrupulous adherence to his own prescription, have been exposed for weeks to temperatures varying from 80 to 90 degs. Fah., and have remained perfectly sterile throughout. A temperature 20 degs. lower than these rapidly develops putrefaction in the common air."

AN Eastern paper gives an account of an accident that happened to a man who was at work near a shaft that revolved at a rate between 100 and 150 times per minute, and who, being caught, was whirled around and then thrown off unharmed, but with only his shoes and stockings left on. Two similar accidents happened in this vicinity at different establishments; in neither instance were the victims hurt, but only their shoes and stockings left on.

IF a ladle of molten (pig) metal be poured in steady stream on to a chilled cast iron body it will cut a hole in it more rapidly than if poured on a cast iron body that has not been chilled.

NO TIME TO READ.—We have often encountered many who profess to believe they have no time to read. Now we think of it, there have always been men of such characters, the points of which are easily summed up.

Nine times out of ten, they are men who have not found time to confer any substantial advantage either upon their families or themselves.

They frequently spend whole days in gossiping, tipping and swapping horses, but they have no time to read.

They sometimes lose a day in asking advice of their neighbors; sometimes a day in picking up news, the prices current, and the exchange, but these men never "have time to read."

Such men generally have uneducated children, unimproved farms, and unhappy firesides. They have no energy, no spirit of improvement, no love of knowledge; they live "unknowing and unknown," and often die unwept and unregretted.—*Ex.*

CHEAP SEWING MACHINES.—It is said that the refusal of Congress to extend the patent for the "four motion feed" in sewing machines, owned by the Wheeler & Wilson and Willcox & Gibbs companies, which required all other manufacturers to pay a heavy royalty for the use of it, promises to reduce the price of machines before long about 30 per cent.



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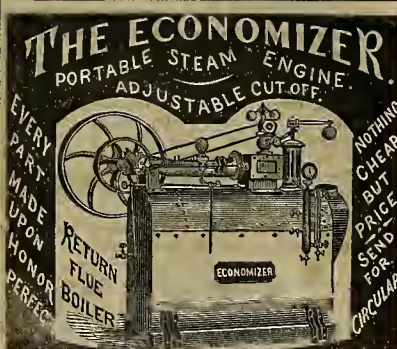
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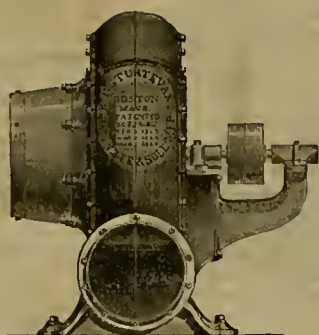
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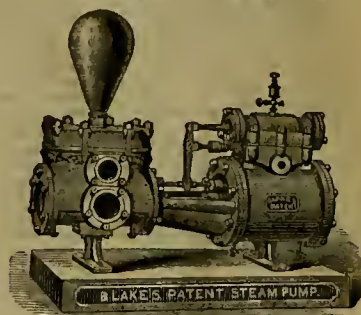
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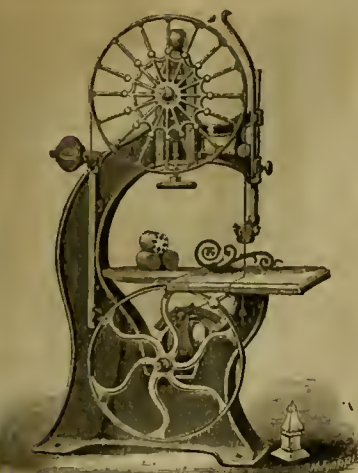
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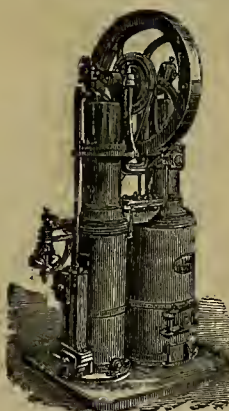
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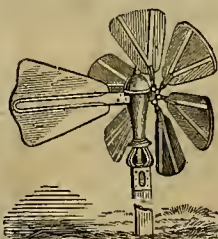
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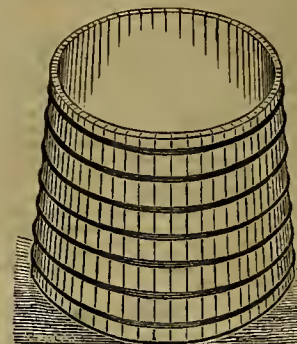
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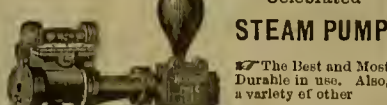
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California Acclimatizing Society—Location

of principal place of business, San Francisco, Cal. Notice is hereby given, that at a meeting of the Board of Directors, held on the seventh day of April, 1876, an assessment (No. 7) of fifty (50) cents per share was levied upon the capital stock of the corporation, payable immediately, in United States gold coin, to the Secretary, at the office of the company, room 37, Nevada block, No. 309 Montgomery street, San Francisco, Cal. Any stock upon which this assessment shall remain unpaid on the seventeenth day of May, 1876, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Wednesday, the seventh day of June, 1876, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors, W. W. TRAYLOR, Secretary, pro tem.

Office, room 37, Nevada block, No. 309 Montgomery street, San Francisco, Cal.

The California Watch Company—Location

of principal place of business, No. 120 Sutter street, San Francisco, Cal. Notice.—There are delinquent upon the following described stock, on account of assessment levied on the eighth day of March, 1876, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Am't.
M Godley, trustee.....	1	3,000	\$15,000 00
A Rammelsberg, trustee..	2	200	1,000 00
A Rammelsberg, trustee..	3	100	500 00
T M Antisell.....	4	10	50 00
A Rammelsberg, trustee..	5	1,120	5,600 00
Paul Gordon.....	33	50	250 00

And in accordance with law, and an order of the Board of Directors made on the eighth day of March, 1876, so many shares of each parcel of such stock as may be necessary, will be sold at public auction at the office of the company, on the first day of May, 1876, at the hour of twelve o'clock, p. m., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

H. T. GRAYES, Secretary.

Office, No. 120 Sutter street, room 10, San Francisco, Cal.

Eureka Stone Manufacturing Company—

Location of principal place of business, city and county of San Francisco, State of California. Notice is hereby given that at a meeting of the Board of Directors, held on the eighteenth day of March, 1876, an assessment (No. 3) of fifty (50) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, No. 857 Market street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the twenty-fourth day of April, 1876, will be delinquent, and advertised for sale at public auction, and unless payment is made before will be sold on the eighth day of May, 1876, to pay the delinquent assessment together with costs of advertising and expenses of sale.

P. D. MOWELL, Secretary.

Office, No. 567 Market street, San Francisco, Cal.

Klamath Quartz Mining Company—Location

of principal place of business, San Francisco, Cal. Location of works, Liberty township, Siskiyou county, Cal. Notice.—There are delinquent upon the following described stock, on account of assessment levied on the second day of March, 1876, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
E A Richardson, trustee....	44	500	\$1500 00

And in accordance with law, and an order of the

Board of Directors, made on the second day of March, 1876, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the office of the Company, room 8, No. 315 California street, San Francisco, Cal., on Tuesday, the second day of May, 1876, at the hour of one o'clock, p. m., of said day, to pay said delinquent assessments thereon, together with costs of advertising and expenses of the sale. J. F. NESMITH, Secretary.

Office, room 6, 315 California street, San Francisco, Cal.

The Golden Sun Gold Mining Company.

Location of principal place of business, San Francisco, Cal. Location of works, Forks of Butte Mining District, Butte county, Cal.

Notice.—There are delinquent upon the following described stock, on account of assessment (No. 1), levied on the first day of March, 1876, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Robt R Walker.....	1001	20	\$5 00
Robt R Walker.....	1002	20	5 00
Robt R Walker.....	1003	20	5 00
Robt R Walker.....	1004	20	5 00
Robt R Walker.....	1005	20	5 00
Robt R Walker.....	1006	10	2 50
Robt R Walker.....	1007	10	2 50
Robt R Walker.....	1008	10	2 50
Robt R Walker.....	1009	10	2 50
Robt R Walker.....	1010	10	2 50
Robt R Walker.....	1011	10	2 50
Robt R Walker.....	1012	10	2 50
Robt R Walker.....	1013	10	2 50
Robt R Walker.....	1014	10	2 50
Robt R Walker.....	1015	5	1 25
Robt R Walker.....	1016	5	1 25
Robt R Walker.....	1017	5	1 25
Robt R Walker.....	1018	5	1 25
Robt R Walker.....	1019	5	1 25
Robt R Walker.....	1020	5	1 25
Robt R Walker.....	1021	5	1 25
Robt R Walker.....	1022	5	1 25
Robt R Walker.....	1023	5	1 25
Robt R Walker.....	1024	5	1 25
Robt R Walker.....	1025	5	1 25
Benj F Josselyn.....	1052	50	12 50
Benj F Josselyn.....	1053	50	12 50
Benj F Josselyn.....	1054	50	12 50
Benj F Josselyn.....	1055	50	12 50
Benj F Josselyn.....	1056	50	12 50
E Pierce Hutchins.....	1074	500	125 00
E Pierce Hutchins.....	1075	100	25 00
E Pierce Hutchins.....	1076	100	25 00
E Pierce Hutchins.....	1077	100	25 00
E Pierce Hutchins.....	1078	100	25 00
E Pierce Hutchins.....	1079	100	25 00
E Pierce Hutchins.....	1080	100	25 00
E Pierce Hutchins.....	1081	100	25 00
E Pierce Hutchins.....	1082	100	25 00
E Pierce Hutchins.....	1083	100	25 00
E Pierce Hutchins.....	1084	30	7 50
E Pierce Hutchins.....	1085	25	6 25
Fred Franks, Trustee.....	1058	1058	261 68
S H Sheplar, Trustee.....	1092	100	25 00
S H Sheplar, Trustee.....	1093	100	25 00
S H Sheplar, Trustee.....	1094	100	25 00
S H Sheplar, Trustee.....	1095	100	25 00
S H Sheplar, Trustee.....	1096	100	25 00
S H Sheplar, Trustee.....	1097	50	12 50
S H Sheplar, Trustee.....	1098	50	12 50
S H Sheplar, Trustee.....	1099	50	12 50
S H Sheplar, Trustee.....	1100	50	12 50
S H Sheplar, Trustee.....	1101	50	12 50
S H Sheplar, Trustee.....	1102	50	12 50
S H Sheplar, Trustee.....	1103	50	12 50
S H Sheplar, Trustee.....	1104	50	12 50
S H Sheplar, Trustee.....	1105	50	12 50
S H Sheplar, Trustee.....	1106	50	12 50
S H Sheplar, Trustee.....	1107	50	12 50
S H Sheplar, Trustee.....	1108	20	5 00
S H Sheplar, Trustee.....	1109	20	5 00
S H Sheplar, Trustee.....	1110	20	5 00
S H Sheplar, Trustee.....	1111	20	5 00
S H Sheplar, Trustee.....	1112	10	2 50
S H Sheplar, Trustee.....	1113	10	2 50
S H Sheplar, Trustee.....	1114	10	2 50
S H Sheplar, Trustee.....	1115	10	2 50
S H Sheplar, Trustee.....	1116	10	2 50
S H Sheplar, Trustee.....	1117	10	2 50
S H Sheplar, Trustee.....	1118	10	2 50
S H Sheplar, Trustee.....	1119	10	2 50
S H Sheplar, Trustee.....	1120	5	1 25
S H Sheplar, Trustee.....	1121	5	1 25
S H Sheplar, Trustee.....	1122	5	1 25
S H Sheplar, Trustee.....	1123	5	1 25
S H Sheplar, Trustee.....	1124	8	2 00

And in accordance with law, and an order of the Board of Directors, made on the first day of March, 1876, so many shares of each parcel of said stock as may be necessary, will be sold at public auction on the 24th day of April, 1876, at the hour of two o'clock, p. m., at the office of the company, 702 Market street, room 2, San Francisco, Cal., to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale. J. S. PENTECOST, Secretary.

Office, 702 Market street, San Francisco, Cal.

Josephine Gravel Mining Company—

Location of principal place of business, San Francisco, California.

Notice.—There are delinquent upon the following described stock, on account of assessment (No. 1) levied on the twenty-third day of February, 1876, the several amounts set opposite the names of the respective shareholders as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Barth J. F. Trustee.....	10	1500	\$150 00
Boyd, John F. Trustee.....	14	500	50 00
Dow, C. C.....	6	1000	100 00
Mitchell, J. C.....	9	4000	400 00

And in accordance with law, and an order of the Board of Directors, made on the 23d day of February, 1876, so many shares of each parcel of said stock as may be necessary, will be sold at public auction, at the office of the company, room 2, No. 535 California street, San Francisco, on the tenth day of April, 1876, at the hour of one o'clock p. m., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of sale.

WM. SMALL, Secretary.

Office, Room 2, No. 535 California Street, San Francisco, Cal.

POSTPONEMENT.—By order of the Board of Directors of the Josephine Gravel Mining Company the above sale is hereby postponed until Monday, the twenty-fourth day of April, 1876, at the same hour and place as aforesaid.

WM. SMALL, Secretary.

San Francisco, April 6th, 1876.

Lady Franklin Gold and Silver Mining

Company. Principal place of business, City and County of San Francisco, State of California. Location of works, Silver Mountain Mining District, Alpine County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the third day of April, 1876, an assessment of fifty (50) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at his office, 507 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 15th day of May, 1876, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the fifth day of June, 1876, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

F. E. LUTY, Secretary.</

Mining in Butte.

The *Mercury* of April 7th says: Within the past five years the attention of capitalists has been turned to this county, with a view of developing the many rich placer mines that are everywhere throughout the foothills to be found. For years these rich placers were known. In some instances the ground was taken up, and after a time the owners disappeared and were not heard of for years, and only returned when they had succeeded in inducing capital to take hold with them. One case has just come under our notice. We refer to James L. Pond, who some 20 years ago was a resident of this town, doing business here. Then it was almost a daily occurrence for parties to come in from Magalia, loaded down with belts filled with lumps of gold. Many a one looked to this field as the richest to be found in this part of the State. Let the miner burrow anywhere into the hill-sides, and he found gold. At last mining almost ceased, not because the gold had all been taken out, but because it was so difficult to get water to the claims. Each miner left with the impression that in the future he would get rich, return and open here a mine that would astonish the world. Among those that have returned to develop and open up these mines, is the gentleman we have named. He brings with him one of the best surveyors that can be had, and has set him at work making the preliminary survey for a water ditch that will carry some 3,000 inches. He will soon have at work 150 men, and intends to have the whole completed by the first of July. A large and wealthy company has been formed in London, called the Isabinda gold company, limited, of which Mr. Pond is the superintendent. This same ground was being prepared last year, and some 50 men engaged for a long time in getting it into shape. Now it passes into other hands, and the working force is doubled with every prospect, as we said before, of being ready to turn the water on by the first day of July. Old residents of this county will recollect the rich diggings near Dogtown, now called Magalia. This is the claim referred to. It is the one that was purchased a short time ago by Mr. Pond and a Mr. Barry, of London, for \$200,000.

A SCHOOL OF SHEPHERDS has been established at Ramboulet, France, where young men over 15 are instructed in the science of sheep husbandry. The course is for two years.

SEWING MACHINES.—We have a first-class machine we wish to dispose of on favorable terms. Apply at this office.

WIRE ROPE

For Mining, Shipping, and General Purposes.

All kinds and sizes on hand, or made to order; guaranteed of unsurpassed quality, and manufactured of any length. FLAT ROPES, ROUND ROPES and TAPER ROPES, of IRON OR STEEL.

Patent Endless Wire Ropeway

(WIRE TRAMWAY)

FOR THE RAPID AND ECONOMICAL TRANSPORTATION OF ORES AND OTHER MATERIAL OVER MOUNTAINOUS AND DIFFICULT ROADS.

This system has been in use for over three years and given thorough satisfaction.

PATENT GRIP PULLEY,

For transmission of power by means of wire ropes

WIRE.

Fencing Wire and Staples,

BALING WIRE,

SPRING WIRE,

GALVANIZED WIRE,

BROOM WIRE,

STEEL WIRE,

COPPER WIRE,

BRASS WIRE

And Wire of all kinds, on hand or made to order.

SOLE AGENT FOR

Richard Johnson and Nephews' Celebrated Telegraph Wire.

Full stock on hand in bond, or duty paid.

Wire Cloth and Wire Netting,

Full Assortment on hand for all Purposes,

—AND—

All Kinds of Goods in the Wire Line.

Send for Circulars, etc., to

A. S. HALLIDIE,

113 and 115 Pine Street, S. F.

Giant Powder.

Patented May 26, 1868.

THE ONLY SAFE BLASTING POWDER IN USE.

GIANT POWDER, NO. 1,

For hard and wet Rock, Iron, Copper, etc., and Submarine Blasting.

GIANT POWDER, NO. 2,

For medium and seamy Rock, Lime, Marble, Sulphur, Coal, Pipe Clay and Gravel Bank Blasting, Wood, etc.

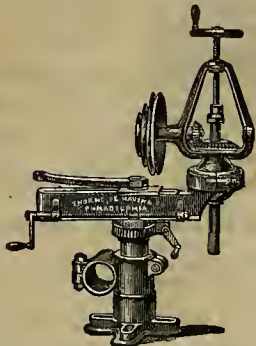
Its EXCLUSIVE use saves from 30 to 60 per cent. in expenses, besides doing the work in half the time required for black powder.

The only Blasting Powder used in Europe and the Eastern States.

BANDMANN, NIELSEN & CO.,

General Agents, No. 210 Front Street.

v22-5m16p



THORNE, DeHAVEN & CO.

21st Street, above Market,
PHILADELPHIA.

DRILLING MACHINES.

PORTABLE DRILLS. Driven by power in any direction, self-feed and convenient adjustment.

RADIAL DRILLS. Self-feed—large adjustable box table—separate base plate, every convenience.

VERTICAL DRILLS. Self-feeding—of new and improved designs.

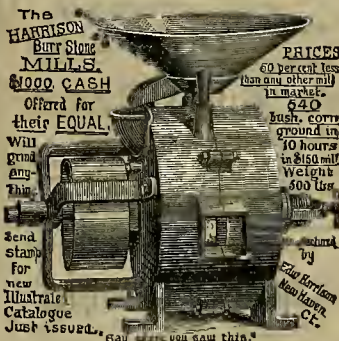
MULTIPLE DRILLS. For boiler work, etc., 2 to 20 spindles, fed and returned by power or hand, together or separately.

HORIZONTAL BORING AND DRILLING MACHINES. For large pieces—with boring head, adjustable, vertically and horizontally.

SPECIAL DRILLS. For special work. Gun Blank Drills, Coal Drills, &c., built to order.

G. W. & C. A. LANE, Exeter, N. H., write, Dec. 13:

"We started the heavy 20-inch Corn Mill last Friday you sent to Baldwin & Tabor, Manchester, N. H. We ran it most all day, and ground 60 bushels corn per hour. The mill you sent us at Haverhill, Mass., for A. S. Hook, is doing wonderfully. It is grinding on an average 2,500 lbs. good meal per hour, and has ground 2,800 lbs. in an hour. It is driven by an engine with a 9-in. cylinder, and takes the place of a 30-in. mill of another kind that, when doing its best and loading the engine with all it could carry, only ground 1,500 lbs. per hour. If there is a mill built that can beat that we would be pleased to see it brought out."



The HARRIS
CORN
MILLS.
\$1000 CASH
Offered for
their EQUAL
Win
grand
any
thing.
Send
stamp
for
new
Illustrated
Catalogue
Just issued.
"Say what you saw this."

PRICES
60 percent less
than any other mill
in market.
\$400
Each, corn
ground in
10 hours
in 1850 mill.
Weight
500 lbs.
Made by
E. H. Harris
Newbury, Ct.

Iron and Machine Works.

THOS. PENDERGAST.

HENRY S. SMITH.

ÆTNA IRON WORKS.

MANUFACTURERS OF

IRON CASTINGS

and MACHINERY.

OF ALL KINDS.

Fremont Street, bet. Howard and Folsom.

SAN FRANCISCO.

THE RISDON

Iron and Locomotive Works,

INCORPORATED.....APRIL 30, 1868.
CAPITAL.....\$1,000,000.

LOCATION OF WORKS:

Corner of Beale and Howard Streets,
SAN FRANCISCO.

Manufacturers of Steam Engines, Quartz and Flour Mill Machinery, Steam Boilers (Marine, Locomotive and Stationary), Marine Engines (High and Low Pressure). All kinds of light and heavy Castings at lowest prices. Gams and Tappets, with chilled faces, guaranteed 40 per cent. more durable than ordinary iron.

Directors:
Joseph Moore, Jesse Holladay, O. E. McLane,
Wm. Norris, Wm. H. Taylor, J. B. Haggis,
James D. Walker.

WM. H. TAYLOR.....President
JOSEPH MOORE.....Vice-President and Superintendent
LEWIS R. MEAD.....Secretary
24v17-qy

Brass Foundry & Pump Factory.

A. J. SMITH, Plumber,

Sole Proprietor and Manufacturer of the Celebrated Hudson Force Pumps, Atwood & Bodwell Windmill Brass Pumps, Smith's Copper-Lined Pumps, Plumbers' Force Pumps.

Special attention paid to Brewers', Distillers', Beer and Hot Liquor Pumps and Wine Pumps. Particular attention paid to AIR PUMPS, also to

DIVERS' SUBMARINE PUMPS.

Artesian Well Pumps Made to Order.

Brass Castings Made to Order.
No. 222 FREMONT STREET, - - SAN FRANCISCO

WM. HAWKINS.

T. G. CANTRELL

HAWKINS & CANTRELL,

MACHINE WORKS,

210 & 212 Beale St.

Near Howard. - - - SAN FRANCISCO.

MANUFACTURERS OF

Steam Engines and all kinds of Mill and Mining Machinery.

Also manufacture and keep constantly on hand a supply of our

Improved Portable Hoisting Engines,

From Ten (10) to Forty (40) Horse Power.

N. B.—Jobbing and Repairing done with Dispatch.

FULTON

Foundry and Iron Works.

HINCKLEY & CO.,

MANUFACTURERS OF

STEAM ENGINES,

Quartz, Flour and Saw Mills,

Hayes' Improved Steam Pump, Brodie's Improved Crusher, Mining Pumps, Amalgamators, and all kinds of Machinery.

N. E. corner of Tehama and Fremont streets, above Howard, San Francisco.

The Phelps' Manufacturing Co.,

MANUFACTURERS

OF ALL KINDS OF CAS WORK,

Machine Bolts, Bridge Bolts and Ship or Band Bolts.

13, 15 and 17 Drumm Street, San Francisco, 4v241y

Miners' Foundry and Machine Works,

CO-OPERATIVE,

First Street, bet. Howard and Folsom, San Francisco.

Machinery and Castings of all kinds.

PACIFIC

Rolling Mill Company,

SAN FRANCISCO, CAL.

Established for the Manufacture of

RAILROAD AND OTHER IRON

Every Variety of Shafting,

Embracing ALL SIZES of

Steamboat Shafts, Cranks, Piston and Connecting Rods, Car and Locomotive Axles and Frames.

—ALSO—

HAMMERED IRON

Of every description and size.

Orders addressed to PACIFIC ROLLING MILL COMPANY, P. O. box 202, San Francisco, Cal., will receive prompt attention.
The highest price paid for Scrap Iron.

OCCIDENTAL FOUNDRY,

137 and 139 First street, - San Francisco.

STEIGER & KERR,

IRON FOUNDERS.

Quicksilver Condensers and Furnace Castings.

Sole manufacturers of the Hepburn Roller Pan and Callahan Grate Bars, suitable for Burning Screenings.

Notice.—Particular attention paid to making Superior Shoes and Dies.

UNION IRON WORKS,
Sacramento.

ROOT, NEILSON & CO.,

MANUFACTURERS OF

STEAM ENGINES, BOILERS,

CROSS' PATENT BOILER FEEDER AND SEDIMENT COLLECTOR

Dunbar's Patent Self-Adjusting Steam Piston PACKING, for new and old Cylinders.

And all kinds of Mining Machinery.

Front Street, between N and O streets,
SACRAMENTO CITY.

SHEET IRON PIPE.

THE

Risdon Iron and Locomotive Works

Corner Howard and Beale Streets,

Are prepared to make SHEET IRON AND ASPHALTUM PIPE, of any size and for any pressure, and contract to lay the same where wanted, guaranteeing a perfect working pipe with the least amount of material.

Standard sizes of railroad Car Wheels, with special patterns for Mining Cars. These small wheels are made of the best Car Wheel Iron, properly chilled, and can be fitted up with the improved axle and box—introduced by this company, and guaranteed to outlast any other wheels made in this State.

All kinds of Machinery made and repaired.

24v23-3m JOSEPH MOORE, Superintendent.

CALIFORNIA BRASS FOUNDRY,

No. 125 First Street, opposite Minna,
SAN FRANCISCO, CAL.

All kinds of Brass, Composition, Zinc, and Babbitt Metal Castings, Brass Ship Work of all kinds, Spikes, Sheathing Nails, Rudder Braces, Hinges, Ship and Steamboat Belts, and Gongs of superior tone. All kinds of Cocks and Valves, Hydraulic Pumps and Nozzles, and Hose Couplings and Connections of all sizes and patterns, furnished with dispatch.
PRICES MODERATE.
J. H. WEED. V. KINGWELL.

California Machine Works,

119 BEALE STREET, SAN FRANCISCO.

BIRCH, ARGALL & CO.,

Builders of QUARTZ, SAW AND FLOUR MILLS

Keating's Sack Printing Presses,

THE ECONOMY HYDRAULIC HOIST FOR STORES,

And General Machinists. 25v28-3m

THOMPSON BROTHERS,

EUREKA FOUNDRY,

129 and 131 Beale street, between Mission and Howard,
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LIGHT AND HEAVY CASTINGS,

of every description, manufactured 25v16a

STEAM ENGINES AND BOILERS

Of all sizes—from 2 to 60-Horse power. Also, Quartz Mills, Mining Pumps, Hoisting Machinery, Shafting, Iron Tanks, etc. For sale at the lowest prices by

10v27tf J. HENDY, No. 32 Fremont Street.

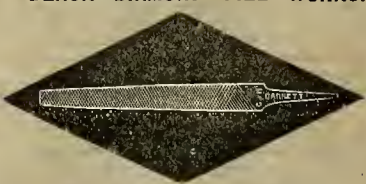
McAFEE, SPIERS & CO.,

BOILER MAKERS

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Howard st., between Fremont and Beale, San Francisco

BLACK DIAMOND FILE WORKS.



TRADE MARK

G. & H. BARNETT,

Manufacturers of Files of every Description

Nos. 39, 41 and 43 Richmond street,

Philadelphia, Pa.

Sold by all the principal hardware stores on the Pacific Coast. 18v25-1y

\$5 to \$20 Per Day at home. Terms free. Address G. STINSON & Co., Portland, M.

MINING MACHINERY DEPOT,

PARKE & LACY, 417 Market Street, S. F.

SOLE AGENTS FOR



Burleigh Air Compressors,

ROCK DRILLS and
Tunneling Machinery.

HASKINS'
ENGINES AND BOILERS,

(SEMI-PORTABLE)

1, 2, 4, 6, 8, 10 and 12 H. P.

WRIGHT'S

Bucket-Plunger Steam Pump.

COSMOPOLITAN EMERY

WHEELS AND STANDS.



Putnam Machine Company's

MACHINISTS' TOOLS and
Wood Working Machinery.

HEALDS & SISCO

Centrifugal Steam Pumps.

FARMER'S ELECTRIC MACHINE
FOR BLASTING AND HILL'S
EXPLODERS.

HASKINS' BLOWING ENGINES

For Mines.

Large Assortment of

MORSE TWIST DRILLS.



HASKINS' PORTABLE HOISTING ENGINES, constructed especially for economical use in mining districts, with Compressed Air or Steam, adapted to all classes of underground work and made throughout on the interchangeable plan, so that all parts can be duplicated when desired. Catalogues and Estimates given on application.



GOLD MEDAL

AWARDED TO

San Francisco Steam Pumps.



AFTER ONE OF THE

MOST THOROUGH TRIALS

Ever Had in the United States,

BETWEEN COMPETITORS

—OF—

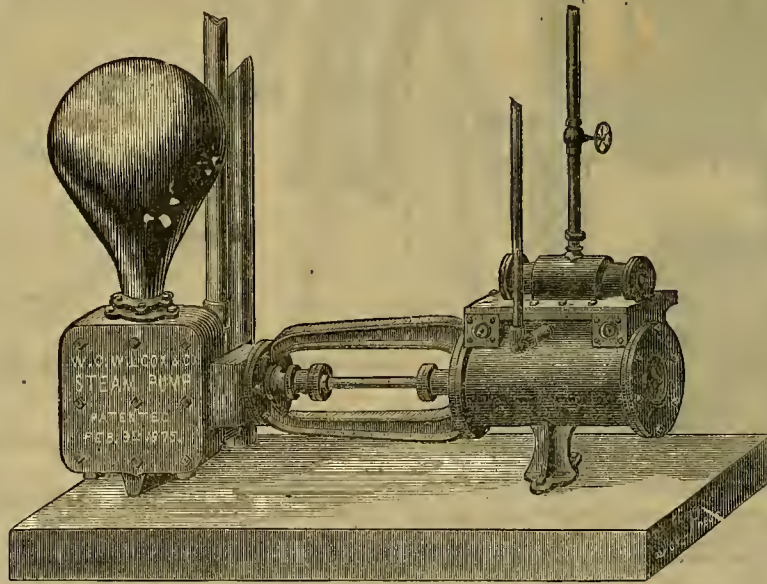
Best Established Reputation,

In which, at great expense, the different Steam Pumps were tried under every test known to experts, the Examining Committee of the Tenth Industrial Fair of the Mechanics' Institute have awarded to us their

GOLD MEDAL

—FOR—

Best Steam Pumps on Exhibition.



We are prepared to furnish PUMPS UNDER CONTRACT, guaranteeing their ability to perform any specific work for which steam pumps are adaptable, such as

RAISING WATER FROM MINES,

FOR WATER WORKS,

FEEDING BOILERS, RAISING WATER FROM WELLS; STEAMER AND SHIP PUMPS, ETC.

We would also call the attention of those interested, to our Direct Acting Deep-Well Pumps for raising water from

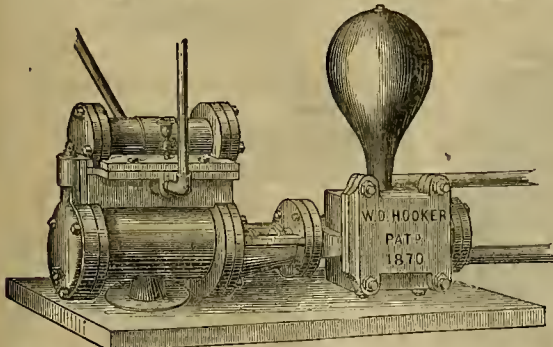
Any Desired Depth.

Also to our Especial Construction of Pumps FOR HANDLING QUICKSILVER or heavy liquids.

We claim that our Pumps are the best ever made in simplicity of construction, economical use of power, durability and perfect adaptability for general uses, and we ask all persons interested to investigate our title to this claim. Salesrooms at our Machine Shop, 114 and 116 BEALE STREET, SAN FRANCISCO.

W. C. WILCOX & CO., Proprietors.

Hooker's Patent Direct Acting Steam Pump.



W. T. GARRATT,
Cor. Fremont & Natoma
streets, S. F.,
Sole Proprietor & Manu-
facturer for the Pacific
Coast.

**SIMPLE, CHEAP AND
DURABLE.**

Adapted for all pur-
poses for which Steam
Pumps are used.
The Best Pump in Use.

SEND FOR CIRCULAR

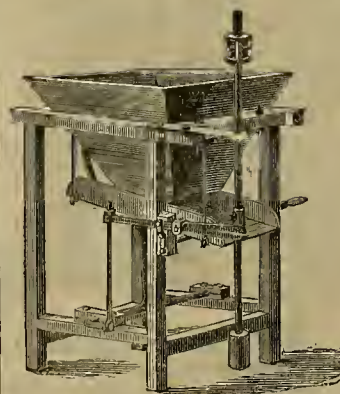
N. B.—Also manufacturer of Hooker's Deep Well and Double-Acting Force Pump. Received the Silver Medal awarded at the last Mechanics' Fair in San Francisco.

THE MINING AND SCIENTIFIC PRESS is one of the best papers published on this coast. It should be in the hands of every miner and mechanic in the State. The issue of last week contained an excellent article on the old product of this coast.—Oroville Mercury, Jan. 28.

ANGELL'S CHARCOAL DENTAL SOAP
for Whitening and Pre-
serving the Teeth, J. W. ANGELL, Prop., San Francisco.

TULLOCH'S AUTOMATIC ORE FEEDERS

Increase the Capacity of each Battery Two to Three Tons per day.



**SAVE LABOR! SAVE MORE GOLD!
SAVE SHOES AND DIES.**

One Man Can Attend to a Hundred Stamps.

**WILL FEED ANY KIND OF ORE,
WET OR DRY.**

ARE DIRECT ACTING. EACH MOTION SCRAPES A POR-
TION OF THE ORE INTO THE BATTERY. CAN
REGULATE THE FEED. ARE SIMPLE AND
DURABLE. ARE IN USE IN CALI-
FORNIA, NEVADA, IDAHO AND
MEXICO. WARRANTED
TO WORK.

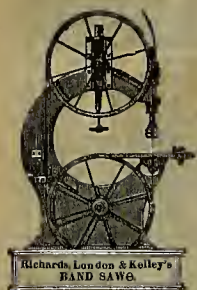
F. OGDEN, Sole Agent,

417 Market Street, S. F.

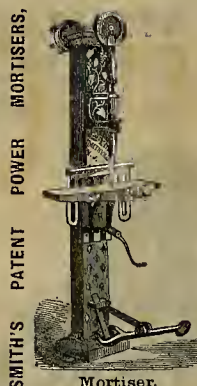
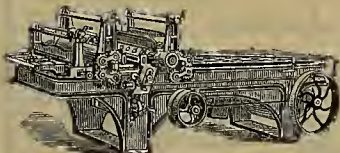
California Planers and Matchers, and Wood Working Machinery of all Kinds

California Planer and Matcher

Is gotten up from new patterns specially for this Coast. It has Cast Steel Slotted Cylinder Head, running in patent self-oiling boxes; will plane 24 inch wide and six inch thick, and tongue and groove 14 inch wide. Will make rustio and stick gutters, or heavy mouldings, etc., and is the best job machine ever built. We have always on hand these machines with or without under cutter head, also, a large assortment of Planing Mill Machinery.



Richards, London & Kelley's
BAND SAW.



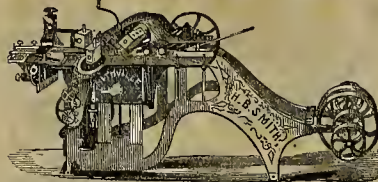
SMITH'S PATENT
POWER
MORTISERS.

Mortiser.

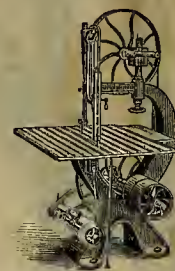
WITH
LATE
IMPORTANT
IMPROVEMENTS.

Smith's Celebrated Molders.

We have four sizes of these Machines always on hand—"P," "Q," "D" and "E,"—to work either three or four sides. Have slotted heads and all other improvements, and may be seen in any mill on the Coast. Prices reduced to 15 per cent. less than Eastern list. We have also, a large stock of all kinds of Planing Mill Machinery, such as Molders, Mortisers, Tenoners, Band and Jig Saws, etc. Send for our new Illustrated Catalogue. BERRY & PLACE, Selling Agents.



Smith's Celebrated Moulders.



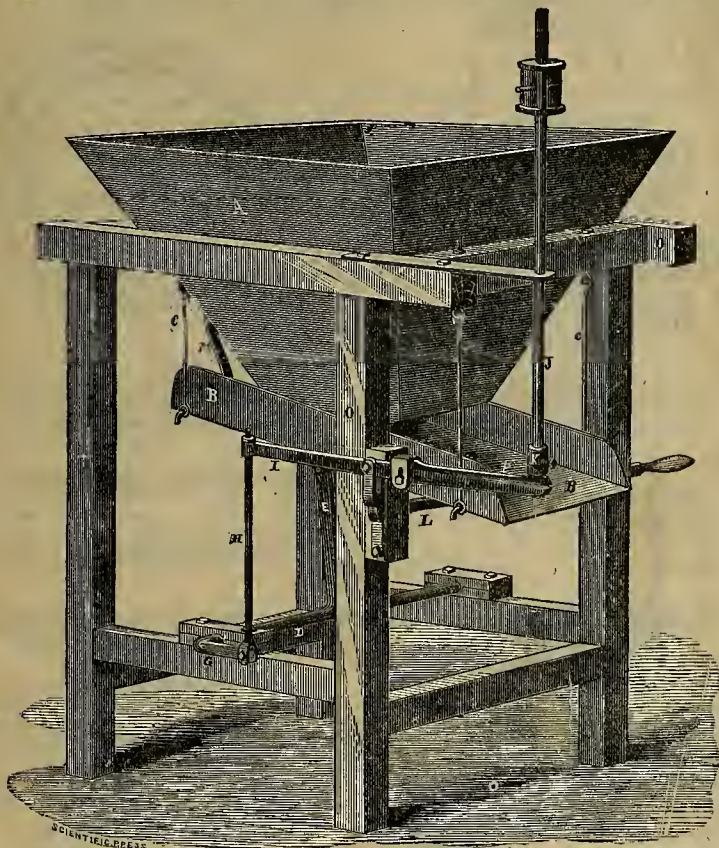
Patent
Band and Jig Saw

BERRY & PLACE, Agents,

MACHINERY DEPOT:
Market, Head of Front Street,

San Francisco.

TULLOCH'S AUTOMATIC ORE FEEDER.



The TULLOCH AUTOMATIC ORE FEEDERS have been practically tested during the last year and a half in twenty-seven mills, of from five to eighty stamps each, and have, in every case, given perfect satisfaction. Refer to the following Mills: California, Con. Virginia, Northern Belle, Leopard, Trench, Humboldt, Douglas, Phoenix, Hite, Crescent, and others. Prices Reduced. Send for Circulars.

F. OGDEN, Sole Agent,
417 Market Street, San Francisco.

NOTICE.

A Quartz Mine and Mill For Sale.

The Mill containing one five stamp battery, free water power. Sample of rock from the Mine can be seen at the MINING AND SCIENTIFIC PRESS office, San Francisco. Location: Oregon Gulch, near Croville, Butte county, Cal.

About thirty or forty tons of Quartz are already out and every day am taking out more.

A. GRUMMET.

PAUL'S DRY PROCESS.

An effective, cheap and practical way of obtaining the highest percentage of Gold and Silver at the least expense. For plans, pamphlets, or particulars, apply to

ALMARIN B. PAUL,
Room 20, Safe Deposit Building.

CONCENTRATION OF ORES (of all kinds), including the Chlorination Process for Gold-bearing Sulphurets, Arseniurets, and Gold and Silver Ores generally, with 120 Lithographic Diagrams. 1867. The most complete treatise. Published at this office. Price \$5, post-paid.

A Caution to the Public.

The following paragraph appeared in the *Stock Exchange*, April 12th:

"The Jenny Glynn Gold and Silver Mining Company propose to increase its capital stock from twenty thousand shares of the par value of twenty-five dollars each, to one hundred thousand shares of the value of fifty dollars each. The mine is now being worked by the Fryer process, and the most satisfactory results are being looked for soon. The increase of shares will be voted upon on the 17th day of April, and will give five new for one old share."

We cannot but feel gratified by any expression of confidence in the Fryer Process, yet it is due to the public that we should say that we have not made any arrangement with the Jenny Glynn Gold and Silver Mining Company, or with any other company, for the use of our Process for the reduction of refractory ores. No person is authorized to say or do anything for us and in our name, save those who are associated with us and bear our written authority.

ROBT. L. S. HALL, President.

ROBT. M. FRYER, Superintendent.

Grass Valley, Nevada Co., Cal., April 13th, 1876.

PURCHASERS please say advertised in Scientific Press.

ENRIGHT'S PATENT PORTABLE

Wood and Straw-Burning Engines.

Patented July 20th and November 2d, 1875.

Burns Wood or Straw without change, and Coal by changing two plates. Took the Premium at the California State Fair, 1875, as the Best Straw-Burner.

Pioneer Builder of the First Portable Thresher Engine on the Pacific Coast, 1861.

PATENTEE AND BUILDER

OF THE

Best Portable Straw or Wood Burning Thresher Engines, 1876.

Send for Testimonials and Price to

JOSEPH ENRIGHT, San Jose, Cal.

SHERIFF'S OFFICE, SACRAMENTO, Sept. 21, 1875.

MR. J. ENRIGHT—Dear Sir: The Straw Burning Engine I bought of you, and which was used in Yolo County, has given us perfect satisfaction. It is everything you represented. We have had no difficulty in generating all the steam required, and the amount of straw consumed can hardly be misused. We find it much safer, on account of fire, than a wood-burner. Many persons, both there and farmers, have come to see it run, and all express themselves highly pleased. The opinion of all was, that it is just what we need, being safe and economical.

H. M. LARUE.

N. W. SPAULDING'S



PATENT DETACHABLE TOOTH SAWS.

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SUTTER CREEK, February 26th, 1876.

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An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO.,
Patent Solicitors.

SAN FRANCISCO, SATURDAY, APRIL 29, 1876.

VOLUME XXII
Number 18.

The Buckminster Rock Drill.

This drill, one of the latest introduced in the market, has been designed with a view of remedying certain defects of construction and operation which have to a great extent heretofore rendered rock drilling engines unreliable and expensive, both as regards original cost and cost of repairs. We give on this page two illustrations of this drill, one showing it mounted on the tripod and the other showing it on a column for tunnel work.

The Buckminster drill is of the simplest construction possible consistent with efficiency of action, there being no exterior machinery liable to injury from rough usage, all the working parts being enclosed within the cylinder and valve chest. These working parts are few and simple in their arrangement, so that the liability to become injured from accident or ordinary wear and tear is reduced to a minimum. On this drill the most prominent improvements are on the turning and valve movements, and also on the three different clamps. One of these clamps is for holding the drill on the tripod; another is for holding the drill tool in position; and the third is for holding the weights upon the legs of the tripod.

It is unnecessary to describe the details of mechanical construction of those parts which are common to all drills, so we only allude to those which are new and improved. The device for turning the valve is simple. The valve is what is known as the "double D" valve, moving parallel with the axis of the cylinder, and is similar to that applied to ordinary steam engines. To operate this valve a simple and ingenious device is applied. This consists of a lever standing vertically and swinging on a center pivot conveniently secured through the sides of the valve chest. The upper end of this lever is inserted in a slotted hole in the arch of the valve, whilst the lower end of the lever is formed into two cam shaped ends, each working in a slotted way provided for it, in a sleeve piece which fits loosely upon the piston rod between the two piston heads. These slotted ways have three bottom surfaces, slightly inclined for their entire length, and at one end of each slot a sudden rise of the inclined bottom ends the slot entirely, so that the lever whose lower cam-shaped end rests on the bottom of one of the slots is vibrated as the piston moves, and with it the valve is thrown and each end of the cylinder supplied with air alternately.

There are no parts of this device liable to sudden shock or excessive friction, the valve is not more suddenly moved than is desirable, and it is never at rest except when the drill is stopped, so that it is impossible for the valve to stick or clog.

The most important feature of this drill is the device for rotating the drill so as to present the cutting faces in a different position at each blow. This consists in simply cutting the sleeve piece before mentioned into two pieces by a zigzag cut and providing a slot in one-half of the sleeve, in which a lug, fastened in the side of the cylinder, may play back and forth as the piston moves, the slot having a slight twist, as in a rifle. Now, as the piston moves in one direction the sleeve piece turns loosely between the heads of the piston and no effect is produced upon the drill, but when moved in the opposite direction the two parts of the sleeve spread apart, owing to the inclined surface of the cut, and the sleeve being now tightly wedged between the piston heads, which are fast on the piston rod to which the drill is clamped, when the sleeve is rotated (as it will be on account of the pin or lug before mentioned working in the slot,) necessarily the drill will rotate with it, the degree of rotation depending upon the amount of twist given the slot in the sleeve.

This device is extremely simple, there being no extra pieces excepting the pin; there is no possibility of the parts getting out of order; there is no chance for wear, and the motion is positive and never fails of action.

One of the clamps which is improved is that for holding the sliding ways of the drill to its column in the tripod. This clamp is so con-

structed that the drill carriage can be turned clear round the column, and can also turn in a complete circle on the head of the clamp. The clamp is made with a hinge and hinged bolt, and has a sliding wedge, being so constructed that in turning upon this hinged bolt the clamp is made rigid on the carriage, and also clamped rigidly in the column.

Another improved clamp is that which holds the weights on the legs of the tripod. Usually these weights are secured with a key or screw. In this case an eccentric with handle is used, so that when the weight is moved up or down, the eccentric relieves it or secures it by a simple quick movement.

The manufacturers claim that the amount of work which these drills are capable of performing will be found far in excess of that ordinarily accomplished, while the hole is always perfectly true and smooth, so that the full area due to the size of the drill is always obtained, and thus the power of the blast proportionately increased. The economy of this drill in the

matter of the expenditure of power is a marked feature. It is asserted that three of these drills can be run with the power required to move four ordinary drills. In the matter of

fitting and workmanship, the fact is recognized that no kind of machinery is subject to such a strain as that employed in rock drilling, and no pains and expense has been spared to make this machine as near perfect as possible. The parts subject to wear are all made of the best tempered cast steel, giving it the greatest strength with lightness and portability. All the parts are made to gauge and made interchangeable with those of any other machine of the same size. A very important point in this machine, and one that will be appreciated by min-

ing men, is that the drill is very light. It is almost entirely steel, which admits of great facility of handling and all superfluous weight of metal is dispensed with. After handling some of the ponderous machine drills now in use, this one seems nothing at all to move about.



THE BUCKMINSTER DRILL ON TRIPOD.



THE BUCKMINSTER DRILL ON COLUMN.

These drills, though working to a greater advantage with compressed air, may also be operated by steam. The sizes of the holes which the machine is capable of drilling are from half-inch up to five inches in diameter, and any depth up to 40 feet. The rate of drilling of course varies with the quality of rock—easy, ordinarily, eight inches per minute as an average. The number of blows delivered varies according to the size of the machine, 250 to 300 blows per minute being the ordinary speed of a three inch machine.

These drills are now being made at the Pacific iron works, First and Fremont streets, in this city. They also manufacture an air compressor which has several new devices. It is a remarkably compact, simple and efficient machine, and is light and more easily handled than an ordinary compressor. The compression of air is attained with much less than the usual loss by friction, and with a small expenditure of power.

Another New Process.

We have to announce the advent of another new process for extracting the precious metals, which is the idea of Mr. Benjamin J. Harrison, of Santa Rosa, Sonoma county, California. This gentleman called on us recently, and without explaining the details of his invention, told us what he could do with it and about the experiments he had made. He has promised to send us samples of the rock before and after treatment, so that mining men can examine it.

Mr. Harrison says he takes the sulphurets after the rock is crushed and reduces them to a form by which the gold can be extracted easily, or rather, he destroys them entirely and leaves the metal perfectly free. The process is introduced between the crushing and amalgamating as usually practiced. It is intended more particularly for highly sulphureted rock. When there is any lead in the rock it is saved or thrown aside as desired. It is saved entirely separate from the gold, and in a metallic form in little lumps.

From this residue of sulphurets a paint can be made, which the inventor claims will pay all the expenses of the process. This residue is from the sulphurets themselves and is reduced to another form to make the paint, which is saved or not as desired. This process has been tried experimentally, and further experiments are now being made with it.

For a 12-stamp mill the necessary machinery for the introduction of this method of working sulphurets will cost about \$1,500, including chemicals and everything. The expense of operating it will be about the same as the cost of crushing. The claim for this process is quickness, cheapness and effectiveness. The inventor says it will simplify the amalgamation very materially. We are unable to say anything about the details of this process, simply because we are ignorant of them. For the same reason we are unable to say whether there is "anything in it" or not; but are promised the result of the experiments now being made on a practical scale as soon as they are concluded. We will then speak of the matter again.

ESTIMATES.—An old Utah miner, who professes to be familiar with the present condition of all the mining camps in the Territory, estimates the yield for 1876 as follows: Bingham, \$3,000,000; Alta, \$3,000,000; Park City, \$2,000,000; Dry Canon, \$1,000,000; East Canon, \$750,000; Stockton, \$400,000; Tintic, Camp Floyd, Beaver and the Southern Utah districts, \$1,000,000—making a total of \$11,150,000. We have no means of knowing anything of the correctness of these estimates, but they appear pretty large. It is beyond the power of any man to make very accurate estimates of future mining yields, and such statements carry very little weight.

TWENTY-THREE sacks of Gladiator ore, from Boulder, Colorado, were recently sold in Golden at the rate of \$4,000 a ton, the highest price paid for samples of the lot being \$8,000 per ton.

The antimony mines at San Emidio, Kern county, are turning out three and a half tons of crude antimony per day.

CORRESPONDENCE.

Botanical Excursions.

[By J. G. LEMMON.]

No. 2. The Northern Valleys and Lassen's Peak. (Continued.) Part II. Butterfly Valley and the Darlingtonia.

Butterfly valley is a small out-lying dell in the high forest six miles northwest of Quincy. It must be peculiarly situated, and its origin as singular, for it is endowed with the greatest variety of rare, radiant and curious plants of any locality of its size met with thus far in all my exploration of the Sierra. This valley is most intimately related to all my labors, aspirations and achievements—such as they are—for the last five years. The course and aims of my life were so changed by a discovery made here that I beg the reader's indulgence while I narrate.

In Black Hawk ravine, a mining camp near here, while following the business of book selling, five years ago, I found in an almanac a small leaf of a plant most interesting in appearance and which I recognized as belonging to the *Sarcocolla* order, but O, so different from anything ever seen before! All the latent botany of my being—repressed for a lifetime because there was no money in it—was aroused beyond control. I demanded its origin. No one could tell. I ran from house to house. No one knew the place of its growth. At last I betought me of the children—those natural conservators of such facts—and asked the first group met. "I know," said little Mamie Austin, "Uncle Rice brought it down from Butterfly." Here was light. Arrangements were made to have Uncle Rice meet me there two months from that day and guide me to Butterfly and the secret ravine where grew this curious plant. Before the time arrived, as I continued my long trips, I displayed the treasured leaf freely, and at the day agreed upon for the search I met at Black Hawk four persons, with whom I was subsequently to form the most sincere and enduring friendship—Mr. and Mrs. Moser, of American valley, and Mr. and Mrs. Ames, of Indian valley, the last the excellent lady and botanist so often mentioned and honored since by Drs. Gray, Canby and Thurber.

Our hostess at Black Hawk, Mrs. Austin, with her children, also joined the exploring party. This lady, with her husband and family, soon after bought the wonderful Butterfly valley and removed to its Eden garden, where she and Mrs. Maxwell, residing in Glendale, just below, have since done most important botanical work, requiring the expenditure of much time and the closest scrutiny day after day, during season after season.

It was quite a cavalcade, that exploring party. The ladies and children were on horseback, the gents on foot, with the good souled Uncle Rice in the advance, all toiling up the steep mountain trail, tearing through bushes and plowing across streams, but the view that awaited repaid all. Our guide cunningly led the way as if to pass the object. "O, look! There they are!" shouted Mrs. Ames, pointing down toward a small round meadow, bordered with alder bushes, through a gap in which appeared the most wonderful plants to be seen north of tropical America. Every eye was fixed; every throat gave a single exclamation of delight that formed a strange chorus. The ladies and children were quickly helped to the ground and all together ran down to the alders. There, thickly covering a space of a fourth of an acre within the alders, stood the round, tubular, swollen stalks, surmounted with balloon-like scarlet hoods, with dependent, curled, crimson, mustache-like wings, all constituting the insect-catching leaves of the

Darlingtonia Californica.

What a feast followed! How the children ran to pluck and bring leaves to be compared and admired! How we revelled and wondered! Mr. and Mrs. Ames gathered a mass of specimens to be studied at leisure in their quiet home. Mrs. Austin sat down by a splendid plant and at once commenced the close scrutiny which she has continued to give the living plant so many weeks and months since. Some 11 patches of *Darlingtonia* she has found in and around Butterfly, generally clustered around cool springs on a southern slope and at an elevation of about 4,000 to 5,000 feet. Another insect-devouring plant grows in the same bogs with it, the *Drosera rotundifolia*; and on both of these plants Mrs. Austin has bestowed observation and experiment that will be read with interest in lands beyond the sea, for she is as good at noting and reporting as at experimenting.

Observations on Darlingtonia.

Dr. Canby, of Wilmington, Del., wrote, asking 32 questions, and Dr. Gray a long list more, relating to this wonderful plant, its structure, how and what it catches, and what for. Such is the interest manifested, that it will not be strange if one of these eminent scientists, or even the renowned Darwin himself, should visit Butterfly valley in the near future, and there institute those chemical experiments and microscopic observations that determine the law of development by adaptation, which in scarcely any other plant is more beautifully and distinctly illustrated than in *Darlingtonia*.

Fortunately Prof. Bessuy and others have lately, through the columns of the Press, familiarized your readers with the structure (illustrated though with engravings grossly at fault, and which the accompanying photograph may serve to correct), habits and appearance of this carnivora, so I will only add a few important facts, indistinctly derived from dried specimens sent him by me, and reported by Dr. Canby before the American Academy of Sciences, but now abundantly verified by observations on the living plant by Mrs. Austin and myself.

1. The infant leaves. Each season produces a whorl of four leaves, in infancy very different from the leaves on older rhizomae—tubular, open-mouthed, with a long, slender, crimson projection of the mid-rib of the petiole, beyond the large mouth, instead of the hood with the small covered aperture and "mustache" of older plant leaves. This curious departure from the true *Darlingtonia* leaf is sometimes found upon small off-sets, mixed with the other leaves, and affords an argument for the development theory, being evidently vestiges of a change this plant has undergone from the open-mouthed, simple-leaved *Sarcocolla* to this carefully concealed trap and decoy of the *Darlingtonia*.

2. The twisting leaves. The leaves of mature rhizomae are each twisted one-half of a turn round, whatever the length, whether but a half inch or three feet. All the leaves on one plant turn one way, but exactly half of the plants have leaves turning one way, the other half the other way. The four leaf stalks rise to different elevations, the last of the season the highest. Each holds its head outward, i. e., presents its brilliant mustache and entrapping hood facing outward from the center or axis of the plant—evidently with the design of enticing and snaring insects coming from any direction.

3. The alluring sweets. A saccharine fluid of the consistency of honey is secreted by the glands of the hood both without and within, standing in beads along the margins of the expanded cells forming the translucent hoods, and often so abundant as to unite and run down, that on the inside into the forward depression of the hood, that on the outside smearing the mustaches completely, in addition to a similar secretion of the latter.

4. The drowning wells. A water-like fluid is secreted by glands on the inner surface of the tubular petiole, or leaf stalk, which begins to appear at the bottom the very day that the orifice begins to open in the hood above. This fluid continues to accumulate as long as the catching season lasts, is always sufficient to cover the mass of insects, and where the trap is so favorably situated as to catch its stomach full, or when fed to the top, as has often been done, slowly, the fluid will still rise to the necessities of the times, and fill the tube to overflowing.

Why this Deadly Trap?

A most puzzling question. Of course, to catch insects; but why to catch them? What for? While watching the movements of a swarm of insects, hovering over a patch of *Darlingtonia*, this season, I took a bit—a mere fancy, to be sure, but if the flowering season continued through the summer, there would be a color of reason in it. I fancied I detected the operation of a law that rises into the realm of morals and endows these plants ever after with a new interest to me. The operation is no less than the astounding spectacle of a penalty—a death penalty—inflicted by the vegetable kingdom upon the animal, for the sin of disobedience.

Fertilization.

This hint was connected with the fertilization of the plant. Let us glance at the process in detail: The single large flower of the *Darlingtonia*, elevated on a tall scape, from a few inches to two feet above the hooded leaves, is turned downward, at the time of first opening, like a bell; afterward it unbends and becomes erect. While downward the flower expands, the pollen is discharged and the ovules fertilized; but at a first glance it seems impossible as the essential organs are disposed. The five pistils in the center curve outward and upward, bringing their stigmas into the apex of the bell, wherein nectaries are stored the choicest sweets. The five stamens extend downward along the distended petals, holding at arm's length their anthers; a long distance below the stigmas. Now, how will the grains of pollen, discharged from the anthers, get up to the stigmas, else the ovules will not be fertilized—will not mature? See! Here are oval apertures formed by opposed notches in the sides of the crimson petals, through which on five sides you observe the flaming yellow, green and purple sepals, colored and curled so as to form attractive objects from any direction.

Insect Agency.

The flying insect disporting himself among the flowers for the few brief hours of his existence, has an important mission of usefulness to perform in the economy of nature, until of late totally unsuspected.

Always attracted to bright objects—as the moth to the candle, the humming bird to the artificial flower—the flying insect spies in the distance a most fascinating object. As he flies towards it his olfactory organs are greeted by delicious odors, increasing his speed. Alighting momentarily upon the flaming floral envelopes, he finds the increased fragrance issuing from the openings. Immediately he enters, climbs up to the nectaries, but on the way crowds against the partially obstructing anthers and carries a back-load of adhering pollen grains up and presses them against the viscid stigmas,

while diving to his shoulders in the jar of sweets—and thus the flower is fertilized, thus the plant continues to bear fruit year after year, thus the tiny insect is made subservient to use, designed and appointed from the beginning.

Vegetable Vengeance.

Failing to do this (and here is where the fancy spoken of comes in), too heedless of the inborn dictates of duty, or foolishly suspicious of danger in entering a dark flower, the poor creature mauls on in the world exposed himself to destruction by other animals, or starves to death; but in the case of the *Darlingtonia* the neglected flower is avenged (if I may be allowed to use the word) by the cunning leaf of the same plant.

Missing the apertures in the flower, or sheering off from suspicion, yet wheeling round and settling in his flight, he sees the daunting lure of the mustache below, alights upon the very innocent looking hood, feeds upon the sweet and no doubt intoxicating secretion, enters the opening beneath—the thin membrane of the upper surface of the hood fully admitting the light, so he sees his way clear, journeys on over the honey pastures, gorging himself with sweets, passes easily the boundary rim so difficult to retrace, slips on the glassy neck of the tube, falls into the pit, struggles against the downward projecting hairs, dives into the water and is drowned—as he deserves!

His carcass is fed upon by the larvae of other insects in waiting, and no doubt the choicest bits are assimilated into the plant, forming the incentive agents, the sinews of war for the destruction of all of his kind.

The Peavine Refractory Ores.

EMERSON PRESS:—The ores of the Peavine district have been long known to be rich in silver, but have hitherto proved too refractory for profitable work by any known process. The chemical compounds are so complicated, each one holding so tenaciously to its portion of silver, and only releasing it, perhaps, to form some equally difficult combination—that new obstacles to a proper reduction of the ore have constantly arisen to take the place of those which were vanquished. The owners of the mines have tried probably all the methods in use on this coast, and have spent a great deal of money in their experiments without any satisfactory results until now. But at this date some of them are much encouraged by the working of the O'Hara furnace and the developments of the Fryer process. The former is in use by the Poe Consolidated company, at the Paymaster mine. This company put up a mill in 1873 to work their ore by wet crushing, but failing to get any result by this method, it was determined to try a furnace process, and in the winter of 1874-5 the furnace known as the McGlan patent was put up and the mill changed from a wet to a dry crusher.

As this furnace had succeeded well with other ores, high hopes were entertained of its success here. But these were doomed to disappointment, and it was rejected after a brief trial. In the spring of 1875 a contract was made with D. J. O'Hara to put up one of his furnaces. This also was beaten by this rebellious ore, but there being encouraging indications that it would succeed with some changes in the manner of working, another trial was made with a furnace of increased capacity. In a short time the managers expressed themselves satisfied that the furnace would do their work. It was therefore accepted and paid for and is now in operation. They certainly deserve to succeed in view of the pluck and determination exhibited, having expended in works and tests over \$150,000 without, until now, any returns. For the past ten days the furnace has been working steadily with a continued improvement in the quantity and quality of bullion produced, and they now believe that they have an assured future. Another company, whose mine is in this district, the Golden Fleece gold and silver mining company, have had to exercise much patience and resort to long and tedious investigations in their efforts to have their ore worked. They began work in October, 1873, by running a tunnel 910 feet, and struck the ledge at 460 feet from the mouth of the tunnel. From this point an incline was run 82 feet, all the way in ore of about the same quality, and an air shaft was raised 112 feet to the surface, so constructed as to be used also for hoisting. The remaining 450 feet of the tunnel continues in ore of good quality. The whole is substantially timbered; thus being prepared for active operations whenever they should find a satisfactory method of reducing their ore. After numerous tests, extending over several years' time, they determined that the Fryer process gave the best results and that they would patiently wait until the company was ready to put up the works. The test by the Fryer process upon which they principally relied, was one of 18 pounds of their worst (most rebellious) ore, which gave 8 dwts. of silver, 940 fine, and a fractional quantity of gold, the assay value per ton being \$54.60, of which \$9.18 was gold. Their patience and faith are now about to be rewarded, having contracted with the Fryer company for the construction of the first works which will be put up for any one. One of the Messrs. Fryer visited this mine a few days since, when the agreement was consummated, and it is expected that

the furnace will be in operation in two months from this date. As the company has about 3,000 tons of ore on the dump and in the ore house, they expect to have no delay in the production of bullion when the furnace is ready.

There are numerous other claims in the Peavine district on which more or less work has been done, but the owners are waiting for and profiting by the experience which shall teach them the best methods of working these difficult ores.

The mining interests of the Washoe country have the prospect of being further increased by recent discoveries of quicksilver. If the agricultural resources of this valley are to be supplemented by a full development of the mineral wealth of the hills which surround it, Reno is destined to become a city of size and importance.

Reno, Nevada, April 17th, 1876.

The Glaciarium.

A very interesting account of a novel arrangement comes to us in *Engineering*, by which John Gamgee has succeeded in maintaining an artificial skating rink in Chelsea. It is called the "Glaciarium." We condense from *Engineering* an account of the affair, partially because Mr. Gamgee has succeeded in producing an artificial skating ground where many others have failed, but chiefly because his process involves a new method of ice making which may prove valuable in producing ice for the mouth as well as the feet. In designing the skating rink at Chelsea, Mr. Gamgee originally proposed to have a floor of iron plates carried on transverse girders of the same metal, which were laid on wood bedded on concrete, the refrigerating liquid flowing through the spaces thus formed. This was in 1874, but in practice Mr. Gamgee considerably modified his notion of laying a system of cast iron pipes of rectangular section connected on a bed of concrete, and grouting them with cement. In the case of the Glaciarium the concrete bed is 24 feet long by 16 feet wide, giving only a comparatively small rink of about 43 square yards area; but then it is an experimental rink. Around the concrete is a raised ledge forming a trough containing water to be congealed, which is about 2 inches deep, and which surrounds three sides of each of the pipes. In selecting the liquid for producing congelation, Mr. Gamgee discarded the use of brine for the reason that saline solutions act destructively on metallic surfaces from galvanic and chemical causes. Besides, such media are themselves liable to congelation if exposed to too low a temperature, or if the circulation be sluggish, so that a fatal obstruction might be caused. He therefore uses as a cold transmitting liquid a mixture of glycerine and water, which remains uncongealed at a temperature below zero. This liquid is pumped up at starting from the refrigerator into a tank, the bottom of which is about 10 feet above the level of the machinery house in which it is placed, and where it is kept at the required temperature. From the tank the liquid flows by gravitation through about 55 feet of pipe to the rink, and having passed through the tubes imbedded in the ice, returns by gravitation to the refrigerator to be pumped gently up again into the tank. Before, however, the solution enters the main refrigerator it passes through a worm in an auxiliary refrigerator, which is supplied with ice-dust produced by the skaters on the rink, the dust being mixed with salt.

The freezing apparatus is an ether machine, the ether being exhausted from the refrigerator, and forced into the condenser by an air pump driven by a steam engine. About four gallons of ether is the quantity stated by Mr. Gamgee to be in use, while he affirms that it requires but very infrequent renewal, and then only in very small quantities. The refrigerator is a copper box about five feet square, fitted with a series of vertical tubes, and placed in a wooden tank. The glycerine mixture surrounds the copper box and passes through the tubes, the ether of course being inside. The condenser is about the same size as the refrigerator, and is similarly constructed, except that the tubes are placed horizontally, and are double. The condensing water circulates through the inner tubes and outside the outer tubes, whilst the ether passes through the annular space between the two tubes, returning thence to the refrigerator. It will thus be seen that there are two circulating systems maintained, that of the glycerine solution and that of the ether, both of which have worked uninterruptedly since the ice was first formed and the rink opened, which was on the seventh of January last.

THE VALUE OF TIMBER.—An illustration of the value of timber on waste lands is afforded by a sale of wood which took place on the estate of the Earl of Cawdor, in Nairnshire, the other day. In 1820 two hills, about 300 acres in extent, were planted with fir and other trees, and after successive thinnings, the sale of which realized large sums, the remainder of the wood has just been sold off for the sum of £16,000. The sums realized for the wood on this waste land during the 50 years is stated to be equal per acre to the return of this best arable land in the country.

THE California State medical society has held its ninth annual session in this city, the past week, at the rooms of the Young Men's Christian association. The attendance exceeded that of any previous meeting. A large number of new members were received. The association is still in session as we go to press.

MECHANICAL PROGRESS

A Lesson from Japan.

The Philadelphia *Telegraph* draws a lesson from the mechanical work which Japanese carpenters are now doing in the erection of a building on the Centennial grounds. It says: The remarkable deftness of the Japanese house carpenters now at work on the Centennial grounds excites admiration in the hearts of all who witness their operations. Many an American workman who flatters himself that he is skilled in his trade, is forced to acknowledge that those Orientals know a thing or two that is beyond him, and is lost in wonder at the neatness, readiness and thoroughness of their operations. Now, how did these Japanese manage to acquire such a mastery of their trade as they certainly have acquired? Most of the nicest and most delicate work executed by them is measured with the eye, and the rule is not used in innumerable instances where an American mechanic of the first rank would consider it absolutely indispensable for the accomplishment of even an approximately good job. Their fitting, however, is a marvel of exactness in every instance, while their knowledge of certain principles of construction appears to be absolutely exhaustive. We do not believe that the skill shown by these men is due to any superior natural aptness, and we are quite convinced that, no matter what their natural aptness may be, they would never have been anything but bunglers had they not been trained for their business with a thoroughness of which we know nothing on this continent. What the Japanese system for the education of workmen may be like we have no idea, but it is certain that it gives a training for eye and hand which no system that has ever been in vogue hereabouts has ever done. We do not believe, however, that there is any particular merit in the course of instruction given to Japanese mechanics, or that we cannot accomplish equal results with methods of training with which we are familiar. The secret of the whole business is that in Japan a tradesman is compelled to really learn his trade, and is not permitted to only half learn it. He is compelled to place reliance upon the instruments which nature has furnished him—his eyes and his hands—until he has them so educated that he is able to calculate upon them serving him with the best effect under all circumstances. Before our mechanics can hope to do work like that now being done by the Japanese at the Centennial grounds, it will be necessary for them to have eyes that can see straight and hands that will instinctively follow the guidance of the eyes. The importance of securing for the rising generation of workmen such education as will render them skilled laborers in what seems to be the Japanese sense of the term, admits of no question. How it is to be secured to them, except by some thoroughly scientific system of technical education which will commence with the smallest children in the primary schools, we do not know. With some such system—and it is far from impossible to put such a one in operation—excellent results can undoubtedly be achieved, although we are very much afraid that it will be a good many years before we shall see American carpenters doing work like that of the Japanese.

A MAMMOTH FILTER.—James Pearson, of Sacramento, has just completed for Governor Stanford's palatial residence in San Francisco a mammoth filter, four feet in diameter and seven feet in height, made of the best boiler iron, with heads of cast iron, weighing 830 pounds each. The filter is constructed on a patent obtained by the inventor in September, 1873, and practical tests in San Francisco as well as Sacramento have shown that the plan is as perfect as can be desired. The packing is composed of gravel, charcoal and sand, and the arrangement is such that the filter may be attached to the water pipe in the basement of a building and the pressure from the hydrant will force the water up through the filtering material and distribute it through the pipes in every portion of the building. The work of cleansing the filtering material is so easy that it can be performed in a few minutes and every day if desired. The filter made for Governor Stanford will probably be sent down to the bay to-day or to-morrow. It has a capacity of about 10,000 gallons daily.—*Record*.

RECOGNITION OF AMERICAN GENIUS.—*The Manufacturer*, a paper devoted to the interests of manufacturers, published in London, England, says: "The important contributions of American inventors to the every-day wants of the manufacturing or mechanical world have become, to use an Americanism, institutions in England. The fertile genius of our American country is fostered by the exigencies of their climate and altered circumstances, and from them we have had, and are still receiving, some of the most striking discoveries and adaptations of our times. That America can offer most valuable suggestions in several spheres is apparent to the most casual observer." *The Manufacturer* then goes on to mention some of the common inventions that have been put in use in this country, illustrating several of them with wood cuts. Among these are the "quick signal railroad lantern," the "distance measuring wheel," the "lightning screwing and tapping machine," etc., to which it awards the highest meed of praise.

Boiler Explosions.

At the annual meeting of the Manchester steam users' association, held at the Manchester town hall on Tuesday, there were exhibited some large boiler plates, showing the rents that had been formed by hydraulic pressure in a full-sized mill boiler of the "Lancashire" type, constructed entirely for experimental purposes. The plates shown contain the fractures developed. The experiments on this boiler, which have just been brought to a conclusion, have extended over about 18 months. The boiler has been burst 11 times, being substantially repaired after each bursting, the entire outer shell at one time being remade. These experiments have led to interesting and important results, of which the following is an official summary. They have shown the weakening effect that steam does have upon cylindrical boilers, and the importance at high pressures of having manhole mouthpieces, as well as all the fitting blocks, of wrought iron instead of cast. They have also proved that the furnace tubes, when strengthened at the ring seams of rivets with onerous hoops or flanged joints, and the flat ends, when suitably stayed, are stronger than the cylindrical portion of the shell, which tends at the longitudinal seams of rivets. In the recent fatal explosion at Rochester on board the steam tug *Prince of Wales*, the flat end failed before the cylindrical portion of the shell, showing that the boiler was malconstructed. The experimental boiler, which was seven feet in diameter and made of plates 7-16th of an inch in thickness, rent in the outer casing at a cast iron manhole mouthpiece at a pressure of 200 pounds on the inch; at a machine made single-riveted longitudinal seam of rivets at a pressure of 275 pounds on the inch; at a double riveted longitudinal seam of rivets at a pressure of 300 pounds on the inch when hand-made, and at a pressure of 310 pounds on the inch when machine-made. The experiments showed the superior tightness, as well as strength, of double riveted to single riveted seams, and of machine work to hand work. The factor of safety adopted by the association, and which they find efficient, is four to one. It had been calculated that the bursting pressure of the boiler would be 300 pounds, which has been verified by the experiments. Boilers of the dimensions just given are guaranteed by the association at a working pressure of 75 pounds on the square inch. The plates of which the boiler has been made are about to be tested in an accurate machine as regards cohesion and elasticity, so as to check the results obtained by water pressure. When these are completed the entire results will be given to the public. The labors of the association have conclusively shown that steam boiler explosions are not accidental nor mysterious, but that they arise in the great majority of cases from the use of boilers unfit for work.—*Iron*.

PIG IRON PAVEMENT.—Twenty different kinds of paving have been tried in Paris; wood paving has been judged, gutta percha paving is too dear, in bitumen paving there is room for improvement, and now paving by pig iron is to be tried in a few days. A bed of mortar is first laid down, which is covered by a strong layer of asphalt; it is in this layer that the iron cakes, which are about 1.6 inches thick, are set. These cakes, it appears, preserve the homogeneity of the bitumen and prevent its depression, and render the asphalt less slippery for horses. This pavement will cost more, assuredly, than the compressed asphalt, but it is estimated that this mode of paving will save 50 per cent upon the repairing expenses, which are very considerable. The end desired is to avoid, by the adoption of a kind of pavement, the depressions in roads over which a great deal of traffic passes. To attain this it does not suffice to pour bitumen upon a well prepared ground lightly covered with a coat of lime; the resistance of the ground should equal that of an old macedamized bank, and a very thick bed of mortar, which should be very homogeneous, should be laid before the asphalt is laid.

THE SEWING MACHINE IN EUROPE.—At the annual soiree of the employees connected with the extensive works of the Howe sewing machine company, Glasgow, Scotland, recently held, the chairman stated that the British islands alone had taken a third of the machines (61,123), which the company had made in 1875. The little kingdom of Belgium, with her 5,000,000 of industrious people, took twice as many machines in proportion to population as Great Britain; but France, with her 36,000,000 of people, as yet took but half as many as Great Britain, with 33,000,000. Germany, with her 40,000,000, did no better. Italy and Spain, the former with 25,000,000 and the latter with 17,000,000, as yet purchased but a few hundred machines per year. Entire Scandinavia was an unexplored region; while Russia, with her 85,000,000 of active and rapidly progressive people, as yet received but the tenth part of what were now sold in Great Britain.

RAILROAD CROSSINGS.—A bill has lately been passed by the Massachusetts legislature providing that "no highway or townway shall hereafter be laid out across a railroad at a level therewith, nor shall any railroad be laid out and constructed across a highway or townway at a level therewith, without the consent in writing of the board of railroad commissioners, in addition to the authority of the court commissioners, as now required."

SCIENTIFIC PROGRESS.

The Way Bessemer Succeeded.

At the last meeting of the British Iron and Steel Institute, one of the most important matters broached was the success which had been gained in producing Bessemer steel by using iron directly from the top of the blast furnace instead of running it into pigs and then melting anew for the converter, as has been the practice thus far. At this meeting Mr. Bessemer made an address, which describes in a very interesting manner the steps by which he gained success. His experience should prove encouraging to all inventors and investigators. His said:

I am exceedingly gratified to hear the account from three gentlemen to-day of the working of my process with iron direct from the blast furnace. The earliest idea I ever entertained of the process was that we should never remelt the iron, and it was only because I had not access to a blast furnace in my experiments that those experiments were made with pig iron. No doubt I had a good deal of advantage in that fact, because I availed myself of that very point of advantage which the last speaker has dwelt upon, and I was enabled to select the metal. In my earliest experiments I happened by a great chance to buy some excellent Blaenavon iron, and got a result so satisfactory with that particular batch of iron that I was ready to conclude that every kind of iron throughout the kingdom would answer the purpose. The very next kind of iron I tried was that produced by our friends at Dowlais, and I need not tell you that they were making a material not suited to my purpose. I can assure you that turning from one of those metals to the other was the greatest blow that I ever received. My fine-spun theory, that all iron would answer the purpose, was knocked in the head in an instant, and it took me something like two years to recover from that blow. I had to try a variety of irons, and in almost every one of them I was unsuccessful. I then thought it necessary to try whether I could get almost absolutely pure, or comparatively pure, pig iron, and I thought, "If my process succeeds with that there is some hope of it still. If not, I must give the thing up." I then obtained some Swedish iron of a very excellent brand, and the result was satisfactory. This showed me that if we had to deal with pig containing but a small quantity of sulphur and phosphorus, we could get an excellent result. That gave me heart to try again. On looking at the iron ores of England I found that in the Whitehaven district there was an excellent ore called the hematite. I purchased some excellent iron there from the Workington company. My friend Mr. Riley and another chemist in London made several analyses of that iron, and I found to my astonishment that it contained a large quantity of phosphorus, though the analysis of the ore showed no phosphorus. I went to the Workington iron company, and said, "If you have any great secrets do not convey them to me, but if you have none will you please let me see all that you do in the production of your iron, for I have got an iron containing a large quantity of phosphorus, and the ore you are making it from contains none." They placed everything at my disposal, but I was able to trace nothing that would account for the phosphorus. In returning back, however, after two hours' inspection, I saw a large quantity of material in the corner of the yard, and I inquired what it was. The answer was, "That is some flux that we use." I said "What is it?" "Well, you know," said my informant, "we sell a good deal of fine hematite ore to the people in Staffordshire, and they fettle their puddling furnaces with it, and we buy it back again, as it makes an excellent flux." Of course I saw that material had picked up the phosphorus from the Staffordshire ore and brought it back again into the Workington iron. I suggested that they should make me a hundred tons of iron in a blast furnace upon a series of charges which I should dictate. I carefully analyzed three samples of iron ore, three samples of lime, and three samples of coke, and selected the purest of those materials. They made me one hundred tons of iron from these materials, and stamped it with B, which, I believe, was the first Bessemer pig, and that iron gave me so excellent a result that from that period onward we have progressed till we have arrived at what you see to-day. I must say that I am exceedingly gratified to see that it has been found practicable in England to work iron direct from the furnace in my process. I have thought to try myself the tapping of three blast furnaces; and when I advised some of my friends in the neighborhood of Barrow to go into the steel making, they did arrange their works, some two or three years ago, so that pig iron might be tapped into a spherical vessel, with a close top, to hold twenty tons. It was resolved to make three seven-ton tappings, and to have a second vessel so as to keep on continuously, and to keep the heat up and avoid skulking in the transit. In fact, it was intended to work by very similar means to those which these gentlemen appear to have used. I may say how exceedingly gratified I am to find that my earliest ideas have been brought, so far, to a favorable issue.

Artificial Ice Making.

The method of making ice or cooling by means of liquefied carbolic acid gas, and its application to the preservation of meat and fruit during its transportation on shipboard, by cooling the air in the storage-room, has proved a total failure. The machinery needed was too expensive, the great resistance to be overcome in compressing the gas requiring a powerful steam engine and very heavy and strong receivers, capable of withstanding a pressure of some 1,000 pounds or more per square inch, exerted by the liquefied gas. The consumption of coal was found to be enormous, while another difficulty was the failure to diffuse the low temperature (some 100 deg. Fah. below zero) evolved at the spot of expansion, through the whole extent of the room to be cooled. This difficulty was found to be similar to that which would be experienced where a large room had to be moderately heated by the hydro-oxygen blow-pipe, producing an intense heat only at one small spot. The ammonia machine described in some books under the name of the Tellier machine, but properly the invention of Carre, has been moderately successful, and succeeded for a few years in lowering (in New Orleans, for instance) the price of ice to one-half. The natural ice, which in summer can be bought in Boston and New York at the wholesale price of \$3 or \$4 per ton, costs the trading companies in New Orleans about \$16 per ton, (including a loss of 60 per cent. before being delivered to the customers.) The Carre ice machine company had for the last five years set their price at \$15 per ton, claiming that the expense of manufacture (counting interest of capital invested, fuel, labor, and deterioration of machine,) amounted to \$6.50 per ton.

The Tellier ice machines, lately offered for sale, are founded on the use of refrigerating mixtures, as the solution of nitrate of ammonia in water; they have the advantage of low price and simplicity, requiring no great power to drive the simple machinery, only the ice cannot be produced cheaply, as the reconvertion of the dissolved salts into primitive dry condition involves much more labor and expense than the refrigeration itself.

The refrigerating machines based on the principle of cooling by expansion of previously compressed air, first invented by Kirk in England, have attracted some attention during the last four years, and especially Windhausen in Germany has done much to perfect, but unfortunately, at the same time to complicate them.

The art of making ice machines has yet to be learned, as was the art of making locomotives.

A Metric Treaty.

The President has recently sent to the Senate for ratification a treaty, the object of which is to establish an international uniformity and precision in the standard of weights and measures. The treaty is between the United States and the governments of Austria, Argentine Republic, Belgium, Brazil, Denmark, Spain, France, Italy, Peru, Portugal, Russia, Sweden and Norway, Switzerland, Turkey and Venezuela. It contains an agreement between all the parties to maintain in Paris, at the common expense, a permanent bureau of weights and measures, to be under the control of an international committee. The bureau is to be charged with the following duties:

1. All comparisons and verifications of the new prototype and of the meter and kilogramme.
2. The custody of the international prototypes.
3. The periodical comparison of the international standard with the international prototypes and of test copies, as well as comparison of the standard thermometers.
4. The comparison of the prototypes with the fundamental standards of non-metric weights and measures used in different countries for scientific purposes.
5. The standardizing and comparison of geodesic measuring bars.
6. The comparison of standards and scales of precision, the verification of which may be requested by governments, scientific societies, or even by constructors or men of science.

NEW SIMPLE SAFETY LAMP.—For some time the police and night watchmen of Paris have been provided with a very simple safety lamp, which they are ordered to use in all shops and warehouses where inflammable materials are kept. A piece of phosphorus about the size of a pea is introduced into a strong glass bottle, and on this is poured warm olive oil, filling about one-third of the bottle, when it is closed with a tight fitting cork. When it is desired to use this lamp, the stopper is removed a moment, so as to give access to the air, when at once the empty space over the oil becomes luminous, and diffuses a light sufficient to find the way in the dark and effect things are all right. When the intensity of the light diminishes, it is sufficient to lift the stopper a single moment, when by the admission of atmospheric air the light is at once restored. Such a lamp can be used nightly for about six months without undergoing any perceptible decrease in efficiency.

PRICES OF METALS.—One pound of iodine will purchase 132,354 pounds of iron, about eight and a half of gold, 22½ of platinum, 135 of silver, 1,018 of nickel, 1,654 of mercury, 6,617 of antimony, 7,780 of tin, 10,180 of copper, 17,650 of zinc, and 24,070 of lead.—*Les Mondes*.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company.	1 Wk to Apr 6.	1 Wk to Apr 13.	1 Wk to Apr 20.	1 Wk to Apr 27.
Adams Hill.	750	750	750	750
Albion.	750	750	750	750
Alma.	750	750	750	750
Alma.	750	750	750	750
Alma.	750	750	750	750
Alma.	750	750	750	750
Alma.	750	750	750	750
Alma.	750	750	750	750
Alma.	750	750	750	750
Alma.	750	750	750	750

Sales at S. F. Stock Exchange.

FRIDAY, A. M., APRIL 21.	110 Confidence.	210/214	
1270 Alpha.	630/674	2165 Con Virginia.	170/16
100 do.	90.614	100 do.	b 10.15
200 do.	90.614	140 Chollar.	103/102
300 do.	90.614	640 Caladonia.	93/9
400 do.	90.614	50 do.	b 5.95
500 do.	90.614	50 do.	b 5.95
600 do.	90.614	50 do.	b 5.95
700 do.	90.614	50 do.	b 5.95
800 do.	90.614	50 do.	b 5.95
900 do.	90.614	50 do.	b 5.95
1000 do.	90.614	50 do.	b 5.95
1100 do.	90.614	50 do.	b 5.95
1200 do.	90.614	50 do.	b 5.95
1300 do.	90.614	50 do.	b 5.95
1400 do.	90.614	50 do.	b 5.95
1500 do.	90.614	50 do.	b 5.95
1600 do.	90.614	50 do.	b 5.95
1700 do.	90.614	50 do.	b 5.95
1800 do.	90.614	50 do.	b 5.95
1900 do.	90.614	50 do.	b 5.95
2000 do.	90.614	50 do.	b 5.95
2100 do.	90.614	50 do.	b 5.95
2200 do.	90.614	50 do.	b 5.95
2300 do.	90.614	50 do.	b 5.95
2400 do.	90.614	50 do.	b 5.95
2500 do.	90.614	50 do.	b 5.95
2600 do.	90.614	50 do.	b 5.95
2700 do.	90.614	50 do.	b 5.95
2800 do.	90.614	50 do.	b 5.95
2900 do.	90.614	50 do.	b 5.95
3000 do.	90.614	50 do.	b 5.95
3100 do.	90.614	50 do.	b 5.95
3200 do.	90.614	50 do.	b 5.95
3300 do.	90.614	50 do.	b 5.95
3400 do.	90.614	50 do.	b 5.95
3500 do.	90.614	50 do.	b 5.95
3600 do.	90.614	50 do.	b 5.95
3700 do.	90.614	50 do.	b 5.95
3800 do.	90.614	50 do.	b 5.95
3900 do.	90.614	50 do.	b 5.95
4000 do.	90.614	50 do.	b 5.95
4100 do.	90.614	50 do.	b 5.95
4200 do.	90.614	50 do.	b 5.95
4300 do.	90.614	50 do.	b 5.95
4400 do.	90.614	50 do.	b 5.95
4500 do.	90.614	50 do.	b 5.95
4600 do.	90.614	50 do.	b 5.95
4700 do.	90.614	50 do.	b 5.95
4800 do.	90.614	50 do.	b 5.95
4900 do.	90.614	50 do.	b 5.95
5000 do.	90.614	50 do.	b 5.95
5100 do.	90.614	50 do.	b 5.95
5200 do.	90.614	50 do.	b 5.95
5300 do.	90.614	50 do.	b 5.95
5400 do.	90.614	50 do.	b 5.95
5500 do.	90.614	50 do.	b 5.95
5600 do.	90.614	50 do.	b 5.95
5700 do.	90.614	50 do.	b 5.95
5800 do.	90.614	50 do.	b 5.95
5900 do.	90.614	50 do.	b 5.95
6000 do.	90.614	50 do.	b 5.95
6100 do.	90.614	50 do.	b 5.95
6200 do.	90.614	50 do.	b 5.95
6300 do.	90.614	50 do.	b 5.95
6400 do.	90.614	50 do.	b 5.95
6500 do.	90.614	50 do.	b 5.95
6600 do.	90.614	50 do.	b 5.95
6700 do.	90.614	50 do.	b 5.95
6800 do.	90.614	50 do.	b 5.95
6900 do.	90.614	50 do.	b 5.95
7000 do.	90.614	50 do.	b 5.95
7100 do.	90.614	50 do.	b 5.95
7200 do.	90.614	50 do.	b 5.95
7300 do.	90.614	50 do.	b 5.95
7400 do.	90.614	50 do.	b 5.95
7500 do.	90.614	50 do.	b 5.95
7600 do.	90.614	50 do.	b 5.95
7700 do.	90.614	50 do.	b 5.95
7800 do.	90.614	50 do.	b 5.95
7900 do.	90.614	50 do.	b 5.95
8000 do.	90.614	50 do.	b 5.95
8100 do.	90.614	50 do.	b 5.95
8200 do.	90.614	50 do.	b 5.95
8300 do.	90.614	50 do.	b 5.95
8400 do.	90.614	50 do.	b 5.95
8500 do.	90.614	50 do.	b 5.95
8600 do.	90.614	50 do.	b 5.95
8700 do.	90.614	50 do.	b 5.95
8800 do.	90.614	50 do.	b 5.95
8900 do.	90.614	50 do.	b 5.95
9000 do.	90.614	50 do.	b 5.95
9100 do.	90.614	50 do.	b 5.95
9200 do.	90.614	50 do.	b 5.95
9300 do.	90.614	50 do.	b 5.95
9400 do.	90.614	50 do.	b 5.95
9500 do.	90.614	50 do.	b 5.95
9600 do.	90.614	50 do.	b 5.95
9700 do.	90.614	50 do.	b 5.95
9800 do.	90.614	50 do.	b 5.95
9900 do.	90.614	50 do.	b 5.95
10000 do.	90.614	50 do.	b 5.95

700 Hussy.	510
230 Jackson.	120/124
805 Kosuth.	120/124
400 Knickerbocker.	620/650
300 do.	620/650
200 do.	620/650
100 do.	620/650
50 do.	620/650
25 do.	620/650
12 do.	620/650
6 do.	620/650

Sales of Last Week and This Compared.

50	Becher	31@32	350	Best & Gelcher	52@22
100	do.	31@32	375	Confidence	11@15
200	do.	b 15 31	400	do.	b 30 16
300	Obollar	10@10	1830	Con Virginia	70@70 1/2
400	California	8 1/2@8 1/2	10	do.	b 30 70
500	California	8 1/2@8 1/2	180	do.	b 5 70 1/2
20	Crown Point	20@20	50	do.	b 30 70
30	Confidence	20	520	Crown Point	16 1/2@16
45	California	10@10 1/2	2125	California	75 1/2@74 1/2
50	California	10@10 1/2	33	Chaffar	8 1/2@8 1/2
35	Con Imperial	62 1/2@62 1/2	8585	Con Imperial	62 1/2@62 1/2
50	do.	b 5 6 5	830	Exchequer	16@15 1/2
55	Exchequer	24@24 1/2	480	G & Curry	11@10 1/2
60	California	12@12 1/2	160	Hale & Norcross	5 1/2@5 1/2
15	Hale & Norcross	6@6	460	Justice	22@20 1/2
30	Julia	14@13 1/2	50	do.	b 5 21
40	Justice	23@20	100	Kentuck	12@11 1/2
50	California	12@12 1/2	500	Mexican	30@30 1/2
10	Lady Bryn	62 1/2@50	100	do.	b 10 30 1/2
35	Mexican	41 1/2@42 1/2	100	do.	b 30 31 1/2
70	Ophir	65 1/2@65 1/2	200	do.	b 5 31 1/2 31 1/2
20	do.	b 5 5 1/2	1835	Ophir	55 1/2@55 1/2
70	Overman	70@70 1/2	808	Overman	8@8 1/2
10	do.	b 5 7 1/2	100	do.	b 30 38
90	Savage	17 1/2@17 1/2	805	Sierra Nevada	15@15 1/2
100	Savage	17 1/2@17 1/2	800	Savage	15 1/2@15 1/2
15	Sierra	20@20	110	Seg Belch	55@55
55	Seg Belch	80@82 1/2	2380	Union Con.	10 1/2@11
60	Utah	24	325	Utah	20@21 1/2
70	California	12@12 1/2	1880	Yellow Jacket	24@22 1/2
80	Y Jacket	22 1/2@22 1/2	220	do.	b 30 2 1/2 @23
90	do.	b 30 32 1/2	100	do.	b 5 33 1/2
50	do.	b 5 33			

AFTERNOON SESSION.		AFTERNOON SESSION.	
90	Alps	9@23 1/2	
100	Alta	3 1/2	
70	Andes	3 1/2	
100	Belmont	1 1/2	
100	Baltimore	2 1/2	
100	Cosmopolitan	4@4	
50	Dayton	50	
100	Europa	75c	
100	Golden Gate	3 1/2	
100	Golden Chariot	3 1/2	
15	Gen Thomas	24@24	
70	Huasey	50	
100	Jackson	50	
100	Kingsber	62 1/2@75c	
100	Kosutsh	2 1/2@2 1/2	
25	Leopard	14@14 1/2	
100	Modell	30	
100	Mansfield	30c	
100	Mint	35c	
90	Meadow Valley	24@24 1/2	
100	Miner	1 1/2	
70	New York	14@14 1/2	
100	Occidental	4 1/2@4 1/2	
50	Freemian	1 1/2	
100	Panther	1 1/2	
15	Poorman	62 1/2@37 1/2	
90	Prospect	50	
25	Raymond & Ely	16 1/2@17 1/2	
50	Rock Island	2 1/2	
100	Rye Patch	50c	
90	Silver Hill	9	
90	South Justice	3 1/2@4 1/2	
100	Silver City	50	
100	Trojan	16@16 1/2	
100	Tyler	35c	
100	Vivian	2 1/2	
50	Woodville	2 1/2	
100	Wells-Fargo	50c	
50	Ward	24@24	

on account of corner-stone laying of new Stock-Building.]

100 Occidental.	400
200 do.	400
300 do.	400
400 do.	400
500 do.	400
600 do.	400
700 do.	400
800 do.	400
900 do.	400

New Incorporations.

St. Lawrence G. & S. M. Co.	April 20th.	Location: El Dorado county. Capital stock, \$100,000. Directors: Thomas Olderson, Augustus Merson, Godfrey Jewell, George M. Lederer and Isaac Levy.
St. Monica M. Co.	April 20th.	Location: El Dorado county. Capital stock, \$100,000. Directors: J. R. O'Connell, E. F. Barber, E. M. Frey, G. Holland and J. S. Barrett.
Roberts Prospecting Co.	April 24th.	Location: El Dorado county. Capital stock, \$10,000. Directors: J. A. Brown, A. D. Conner and L. J. Johnston.

Mining Share Market.

The past few days have witnessed the most sudden and startling revolutions in the stock market. The fluctuations have been more rapid and, in many cases, more disastrous than any changes which have occurred since the great Virginia fire. The general market has been on the down grade for some three weeks or so; and, although the usual summer decline was anticipated, no such panic as has fallen upon California street was looked for. The causes of this marked fall in prices are evident enough, though this would bring small consolation to the suffering public. In the first place nearly every mine and group of mines had had its or their regular winter "deal," the inevitable result of which is to load up the small operators with depreciated stock to their fullest capacity. There had been no astonishing developments made, no new ore bodies of consequence authentically announced, and consequently there was no prop to support public enthusiasm and keep up the excitement. Then, the time is drawing close at hand when the annual drain of coin to the interior begins, a call made by the farmers upon the city for means to meet harvesting expenses, settle accounts, etc., which causes a loss of capital in town not to be relieved until the fall months, when the crop returns from abroad begin to flow in. Besides this, many prominent operators have closed out their accounts, preparatory to making an Eastern or European trip, thus taking a good deal of money out of the market, much of which has gone into real estate for permanent investment. Finally, and to crown all, a feud between the bonanza house of Flood & O'Brien and the clique represented by Jas. R. Keene was reported, and worked up into a highly embellished episode in the sensational press. Mr. Keene is said to doubt the permanency of the Consolidated Virginia ore body, and predicts an early suspension of dividends. Acting upon this information, the whole force of operators, big and little, have simultaneously thrown their securities upon an already overloaded market, thus uncovering quantities of margin stock and precipitating a grand crash, which has been general and sweeping, more or less affecting every stock upon the list. Naturally the weight of the shock falls principally upon the Comstock, and the first to recover will be probably the stocks of the E. Y. and Eureka districts, which have had no "deal" as yet. By reference to our table of comparative quotations the amount of shrinkage in each direction will be perceived.

California Stock Board.

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This (Thursday) afternoon there was no session of the San Francisco stock exchange on account of the ceremony of laying the corner stone of the brokers' new building on Pine street. Speeches were made and a collation served afterwards in the board room. On the street after the morning board prices were worse than ever, everything falling off still worse than for the past two days, and as bad, if not worse, than at the time of the bank failure.

CLOSE SHAVE.—There was a close shave from a dreadful accident at the Combination shaft Sunday night. Four men had put in as many blasts, and after lighting the fuses rang the signal for the bucket to be drawn up. Before the fourth man could get in, the bucket shot up, leaving the miner at the bottom amidst the fizzing fuses. The men in the bucket seized the rope and gave the signal to descend. When they reached their comrade he had succeeded in putting out two of the fuses. They dragged him in and once more began to ascend. When the blasts went off the miners were high enough to escape harm.

THE SANTA RITA PLACERS.—News from the Arizona mines continues to improve. On the 8th inst. sixty ounces of gold dust was brought from the Santa Rita placers, valued at over \$1,000. Among this dust was one nugget weighing three ounces, perfectly pure and free from foreign substances. There is naturally more or less uneasiness among the miners on account of the late Indian outbreak, but work is progressing with usual activity. The number of men at the Santa Rita placers is now about 150.

MIXED.—The affairs of the Mechanics' mine, in Calaveras county, are rather mixed. The majority of the shareholders are represented as anxious to resume work upon the mine, while one of the shareholders is opposed to it and holds the books, papers, etc., of the company in his possession. If the majority want to work we do not exactly see how the single shareholder prevents them, simply by holding the books, etc.

THE Consolidated Virginia, California, Ophir and Belcher mines have each 200 sacks of good average ore ready for shipment to the Centennial exhibition at Philadelphia. These sacks of ore will weigh from 100 to 110 pounds each, and the ore is intended for crushing in the quartz mill now being exhibited at the exhibition grounds by the commissioners of Nevada.

Sales at Pacific Stock Board.

75 Alta.....	3	230 Best & Bel.....	540/544
90 Andes.....	25	10 do.....	540/544
20 Alpha.....	50	50 do.....	90 544
50 do.....	90 55	20 Bullion.....	49
Amazon.....	30 15	300 Baltic.....	25c
Baltimore Con. 1 1/2 @ 1 1/2	800	Boston.....	10c
60 Belcher.....	25 1/2 @ 26 1/2	140 Crown Point.....	18
		250 Oronidia.....	9

Table of Highest and Lowest Sales in S. F. Stock Exchange.

1 Wk to Apr 6.	1 Wk to Apr 13.	1 Wk to Apr 20.	1 Wk to Apr 27.
750	750	750	750
750	750	750	750
750	750	750	750
750	750	750	750

the east cross-cut is steadily advancing, with no new development of interest, and both side drifts north and south from it are showing well, in favorable looking quartz, which promise better developments. The main incline is now down to the 1200-ft level.

GOLD & ORE.—The excavation work for the new and powerful pumping machinery is advancing well, and the north drift at the 1700-ft level will be ready in a few days for the resumption of ore development or prospecting at that point. The shaft is in complete repair, ready for active operations.

KOSKUTZ.—Drifting both north and south at the 500-ft level progresses well, following the vein and the ledge. No cross-cutting as yet. A raise is being made for the south drift of the 320-ft to meet the winze being sunk from the level above, for air circulation purposes.

OVERMAN.—Bottom of shaft still in very hard rock, with something of an increase in the already strong flow of water coming in. Cross-cut east at the 1100-ft level still pushing ahead well. Nothing new to report here or elsewhere in the mine.

SAVAGE.—The tank stanks and hob pits in the shaft, as low down as the 1800-ft level, are completed, or nearly so, and the excavations at the surface for the new and very powerful machinery contracted for are being pushed ahead industriously.

BEST & BELCHER.—Good work is being done completing the drift connecting with the Gould & Curry at the 1700-ft level, and in about a week prospecting the ore vein at this level will be resumed under the most favorable auspices.

NORTH CO. VIRGINIA.—Shaft down 846 feet; bottom in very favorable looking vein matter of a decidedly mineral bearing nature. Some increase of water, but not interfering with the regular good progress of the work.

WARR.—The new shaft is started in a very eligible and advantageous location, and is getting along finely. The grading and other surface work, as well as building preparations, are getting along lively.

DAYTON.—The regular development work at the various levels in this mine goes steadily ahead as usual, and the 750-ft level of the shaft is being opened for, a new working level at that point.

PROSPECT.—Main shaft 198 feet deep, and sinking lively, under a contract let to sink it to the depth of 500 feet. The Ingersoll rock drill is to be employed in this work. The requisite arrangements will arrive tomorrow, and put into operation forthwith. The diamond drill, which was being used for prospecting ahead from the surface, has been discontinued. It passed entirely through the ledge, which it showed to be over 100 feet wide, and giving assays all the way through it which averaged not far from \$100 to the ton. The Prospect company have a good thing when they get down to it with their shaft.

ONTARIO GOLD HILL.—The main shaft is now being retimbered at points where the swelling of the ground has rendered it necessary, and when this work is completed, sinking deeper will be resumed in order to open another level and get at the lower portion of the fine ore body developed in the southern portion of the lower level.

GLASGOW.—This mine is being worked through the combination shaft sunk by the Amazon and Glasgow mining companies. The company have now 17 1/2 acres of ground, titled United States patent, shaft sunk 317 feet, and cross-drifts run the vein and the ledge. The company are now opening up the mine on the 300-ft level. The vein on this level shows some good sulphuret ore, with fine enclosures for finding more as the drift penetrates the vein.

SERRA NEVADA.—Sinking the main shaft is making the usual good progress, the bottom in good working ground. The north drift on the 1500-ft level is opening up fine beds of quartz, and the ledge appears to be much more compact and of a more favorable character at that point than it has shown for some time past on the levels above. On both the 1550 and 1000-ft levels work is going ahead without any changes of interest whatever to report.

LADY WASHINGTON.—Bottom of shaft in very favorable ledge matter, showing considerable improvement, streaks and bunches of fine looking quartz coming in. The material is soft and easily worked, allowing of fast sinking. The pump-bob station at the 600-ft level is completed, and the hole will be sent down and put into working trim forthwith. The new pump and machinery working splendidly.

FLORIDA.—The new machinery is being started up in good shape, and water pumped out of the shaft. Work is resumed, cleaning out and fixing up the drift at the 300-ft level. Sinking will be resumed at an early period for a new level, the developments already made at the 300-ft level being sufficient to show that there is something below well worth going to.

KAISERBERG.—Sinking the main shaft goes ahead actively as usual to open the 300-ft level. Water does not interfere, consequently excellent progress is being made. No large bodies of ore have been met with in the drifts of the lower level thus far, but the showing is exceedingly good for something better before long.

TWIN PEAKS.—Shaft down 80 feet and the splendid ore vein developed at the bottom, mentioned by us a few days ago, is showing, and shows more promising than ever. It is a valuable development and will be followed very energetically. The ore assays well, is of a white granulated texture, and bide fair to lead into a nice little bonanza.

UTAH.—The station is about completed at the 750-ft level, ready to start drifts to cross-cut and prospect the ore vein at that point. The flow of water at the bottom of the shaft remains much the same, giving some trouble to the men engaged in sinking, but is easily handled by the pumps.

SILVER HILL.—Putting the heavy pump in the main incline, with which to drain the flow of water recently struck, is going ahead with all possible energy. There is no particular change to note of the east cross-cut on the third station level, or the cross-cut from the bottom of the new winze.

MONTECAL.—Sinking the shaft is making good progress, the bottom in porphyry interspersed with occasional streaks and stringers of quartz that give low assays of gold and silver, and that look as if it would not now take long to reach the ledge. It is now down 138 feet.

COSMOPOLITAN.—Work is resumed in the face of the main tunnel or adit, following the vein farther to the northward. The upraise in the ore body at this point is up 75 feet and showing well in good mill ore.

LARRY BRADY.—The removal of the old shaft and the pumping machinery, to make room for the deep excavations for the foundations of the new, is going ahead with great vigor. Otherwise nothing new.

CALIFORNIA.—Daily yield 300 tons, all of which is now being crushed by the new mill of the company. This ore is very rich, and gives a splendid showing of bonanza into the company's treasury. Next month another mill will be set to work on ore from this mine, as the widening out of the ore breasts gives additional facilities for extraction. The sinking of the winze below the level of cross-cut No. 6, on the 1550-ft level, is going steadily ahead. With the exception of the extraction of ore, sinking this winze is about all the work that is being done in the mine at present. This winze will be sinking to the depth of 100 feet or more for the double purpose of prospecting the ore vein and affording an air winze whenever the development of the mine below the 1550-ft level is commenced. The California is very likely to take the lead before many months, as the chief producing and dividend paying mine on the Coast.

WARR.—Daily yield, 150 tons of ore. The various breasts are being worked out fully and showing improvement at some points in both quality and quantity. The billion yield for the month will be about \$300,000. At the 1600-ft level the ore shows considerable improvement. The drift south at the 1100-ft level is in better material and cross-cutting will be commenced shortly. The east shaft, from the 1450 to the

1700-ft level, is now fully cleaned out and reopened, and work is resumed at the 1700-ft level once more. The fourth compartment of the main shaft is now completed to 1450-ft level, and the Ophir mine to day is in better working shape than she has been for many months at least.

UNION CONSOLIDATED.—At the 1300-ft level the whole face of the north drift is now in very fine quartz, showing considerable improvement over last week, and giving promise of something better shortly. It continues widening as the drift progresses. The winze below the 1300-ft level is now completed to the 1450-ft level, and a drift started from it to connect with the Mexican. It is in very promising quartz and other vein matter.

MEXICAN.—The northeast drift at the 1450-ft level continues advancing along the wall of the ore vein, occasionally cutting into the side of it, and showing streaks of good ore as it does so. Cross-cutting will be commenced about the middle of next week, when very interesting results may be looked for in the drift.

IMPERIAL.—Face of north drift at the 2000-ft level, running toward the Alpha, still in rich ore. Owing to the drift following the trend of the ledge to the eastward, it is not within 60 feet of the Alpha line, and actual survey would probably show a still greater distance. The drift of the Alpha company, in the Imperial ground, is not into the ore vein as yet, although the indications are favorable.

BULLION.—Main incline progressing downward at the usual good rate, and sinking the north winze from the 1400 to connect with the upraise from the 1700-ft level also progresses well. The face of the northeast drift, at the 2000-ft level, continues in hard black dyke. Some more water is coming in, but not enough to interfere with the work.

BELORE.—Daily yield, 500 tons of ore. The various ore stops and breasts are holding out well, and all the mile are kept running steadily. The powerful new pumping machinery is being placed in working position as fast as is practicable with such heavy work.

WEST BELORE.—West drift now in 140 feet, from which point now drifting northwest to strike the incline. The drift is now in 45 feet in good working ground and with splendid indications. Expect to strike this ledge next week and will commence milling ore.

BALTO CONSOLIDATED.—The hoisting works building is being put up as fast as possible, and the new machinery will be in working position shortly. Mine looking well, and only waiting for the assistance of the new machinery to make a fine showing.

BOOKER.—A full force of men at work grading for the new hoisting works, and foundations for the new machinery, which is all on the ground ready to be placed in working position as soon as possible. All the lumber is also on hand.

AMAZON.—Excellent progress is being made in sinking the joint shaft deeper. At the 300-ft level 24 feet have been added to the drift into the Amazon ground, and fine white sulphuret ore shows in the face.

GRANT.—Prospecting work at the 1800-ft level goes ahead as usual, with no particular change to report. At the 1700-ft level the face of the drift continues in low grade ore, showing a little improvement.

SUPERIOR.—Shaft 80 feet deep to-day, and sinking in porphyry and quartz. Rock hard in streaks, but working well. No water. Drifting suspended at present, and all work concentrated on sinking the shaft.

SUCOCK.—The heavy flow of water encountered in the shaft has subsided a little, but still impedes sinking considerably. Prospecting work at the 550-ft level goes forward as usual. Nothing new.

WOONVILLE.—Under the new management work is well started up and driving ahead lively. Shaft and drift arrangements are being straightened out, and ore production will be better.

TROIAN.—The new machinery will very shortly be completed, ready to start into working operation, when the ore resources of the mine will be sought into and made available.

RED AND WHITE CROSS.—The timbering of the shaft being sufficiently advanced and the galleys or hoisting frame up, sinking is resumed in the main shaft under the most favorable auspices.

HALE & NORTON.—Lively work is being done with the deep excavations for the heavy new machinery foundations, and everything is being pushed forward with characteristic energy.

ROCK ISLAND.—Good work is being done in the drifts at both the 650 and 850-ft levels. Both drifts are advancing well, with good prospects. No new features to report.

NACARA.—The incline shaft is down 283 feet, the bottom in soft ledge matter of a very encouraging character. The sinking is being pressed ahead with great energy.

MORNING STAR.—Sinking shaft at the usual good rate of progress, with no new features to report.

CON. VIRGINIA.—Daily yield, 600 tons. Notwithstanding the great quantities of ore taken from the producing levels of this mine, the diminution of quantity in the great bonanza mass is not so great as might naturally be expected, and depends upon thousands of tons are still in sight, with plenty more to be got when required. At the 1500-ft level the east drift to connect with the C. & C. shaft is steadily advancing in good running ground, and the diamond drill is kept well in advance, in order to guard against any possible unexpected cutting into the heavy body of water known to be in that direction, and being now drained by the C. & C. shaft. This flow of water has been very heavy, but easily managed by the powerful pumps, and it seems now to be on the decrease, the quantity being now 40 inches, miners' measurement, against 43 inches last week. It has been as high as 53 inches.

JUSTICE.—The usual amount of ore comes from the 600-ft level, sufficient to keep the mill running steadily. At the 1000-ft level the north and south drifts are steadily advancing, and cross-cutting will probably soon be commenced at that level. At the 800-ft level the cleaning out and repairing of the south drift is completed and work is resumed at the face in order to carry it through to a connection with the south winze, which has been completed to the 800-ft level.

GLOBE CONSOLIDATED.—The machinery and all other working arrangements are being put in first-rate working trim for the season. The mine will soon be at full work again.

CALIFORNIA.—Water shows some increase, but does not interfere with the good progress being made sinking the shaft. Rock hard at the bottom but blasts well.

PHIL. SHELDON.—The machinery is in place, and the new hoisting works building completed. Everything will be in readiness to start up in a very few days.

NEVADA.—Face of the main drift north all in quartz, which is low grade ore, and showing constant improvement in assays with further advancement.

SOUTH COSMOPOLITAN.—Face of cross-cut still in low grade ore and porphyry. Water decreasing. Total length of cross-cut 335 feet this morning.

SENATOR.—Working day and night preparing to resume sinking the main shaft. Water much reduced and decreasing.

VIVIAN.—Old level giving a very fair yield of pay ore, and south drift driving ahead well in promising ground.

MINT.—Sinking will be resumed in the shaft as soon as the water is got rid of. The new cable works finely.

ROUGH & READY.—Good progress being made sinking shaft, rock working well and water not interfering.

DARDANELLES.—North drift showing well in face. No new developments to report.

PROCTOR.—North drift pushing ahead as usual. No new features to report.

ROCK ISLAND.—Face of drift showing well in fine stringers of quartz.

BOSTON.—Material in bottom of shaft looking and promising finely.

NORTH CARSON.—Face of drift still in hard rock.

THE ENGINEER.

A New Hydraulic Canal Lift.

At a recent meeting of the British Institution of Civil Engineers a paper was read by Mr. Sidsingham Duns, C. E., descriptive of "The Hydraulic Canal Lift at Anderton, on the river Weaver." The object of this lift was to transfer floating barges between the Trent and Mersey canal and the river Weaver, and thus to afford an easy and expeditious means of communication between them, without the expense and delay hitherto incurred in transshipping goods. The idea of lifting the laden barges by hydraulic power originated with Mr. Edward Leader Williams, Jr., M. Inst., C. E., at that time engineer to the trustees of the Weaver navigation. He consulted Mr. Edwin Clark, M. Inst., C. E., on the subject, and after various designs had been considered, the arrangement of the details and the superintendence of the construction were entrusted to the author. This canal and river were closed together at Anderton, but the level of the water in the canal was 50 feet four inches above that in the river. The water in the canal was conducted by a wrought iron aqueduct, 162 feet six inches long, across an arm of the river to the end of the lift. This aqueduct was in three spans, of 30 feet, 75 feet, and 57 feet six inches. It was 34 feet four inches wide, and a central web divided it into two channels, each 17 feet two inches wide. This central web and the sides of the aqueduct were eight feet six inches deep, and formed continuous girders, which carried the aqueduct and the water, five feet three inches deep, contained within it. This total weight of the aqueduct and the water was 1,050 tons, or about six and a half tons per lineal foot. Excepting at the end, where it rested on the masonry of a basin leading into the canal, the aqueduct was carried on cast iron columns. The lift was double; each half consisted of a wrought iron trough 75 feet long and 15 feet six inches wide, capable of containing barges floating in water five feet deep. The sides of the trough were nine feet six inches deep at the center, and seven feet six inches deep at the ends, and formed girders to carry this weight of the trough, water, and barges, which amounted to 240 tons. This weight was transmitted from the sides to the head of a central ram, three feet in diameter, by cantilevers which radiated from the ram to the sides of the trough. The trough was thus supported and moved up and down by one central vertical ram, which worked in a press sunk within a cast iron cylinder below the bed of the river. This pressure on the ram amounted to about four and three-quarter cwt. per square inch. The trough had a lifting gate at each end, for the ingress and egress of barges, and there were corresponding gates in the aqueduct, so that boats could pass between the aqueduct and the trough, according as they were to be lowered or had been lifted. The press under one trough was connected by a pipe, five inches in diameter, with that under the other trough, and thus water contained in one could pass freely into the other, by an equilibrium valve in this pipe. There was also a small steam engine continually pumping water into an accumulator, to assist in the working of this lift. Piping four inches in diameter passed from the accumulator to each of the presses, and the accumulator could be opened to either of the presses as required. All the valves for working this apparatus were under the control of one man in a valve house on the top of the aqueduct. In working this lift, when one trough containing barge and water five feet deep was at the top of the lift, the other containing barge and water four feet six inches deep was in the river below. As the upper trough was heavier than the lower one, it followed that as soon as the valve on the five-inch pipe was opened, the upper trough descended and lifted the lighter one out of the river, until, by becoming in its turn immersed in the river below, it lost part of its gravitation, and forced the lighter trough to within four feet six inches of the top of the lift. The valve on this five-inch pipe was now closed, and this remaining water in the press under the descending trough was allowed to run to waste into the aqueduct. The trough consequently descended into the river, and the barges it contained had been lowered from this canal to the river. While this was going on the accumulator was opened to the press of the ascending trough, and this trough and barges were raised to within six inches of the top of the lift. The barges were lifted the remaining six inches by letting this depth of water into the trough from the aqueduct. Thus a depth of six inches of water over the area of the trough, taken from the upper level, was sufficient to lower one trough from the canal to the river, and, at the same time, with a little assistance from the accumulator, to lift the other from the river to the canal. Automatic siphons insured a depth of four feet six inches of water in an ascending trough. The edges of the gates were kept water tight with india rubber, and this same material was used for making a joint between the troughs and the end of the aqueduct. The time required to lower one trough and to lift the other was three minutes, and the whole operation of transferring barges from the canal to the river, and others at the same time from the river to the canal, was eight minutes. In a chain of locks at Ruacorn having the same fall, a boat could only pass one way in one hour and a half. A very small staff was required to work the apparatus, and the total weekly expenses

did not exceed £10. In addition to the time saved by this lift, compared with a flight of locks having the same fall, it was stated that, when the traffic was equal in such direction, only six inches of water over the area of the trough were used, instead of 50 feet required by the locks. The lift was publicly opened by the trustees in July, 1875, and had given great satisfaction.

Maritime Engineering.

A new plan of dredging river and harbor bottoms has been proposed, which commends itself to the notice of engineers. In removing soft mud and silt from sea and river bottoms a notably interesting device has recently been exhibited. The plan is to use a steam tug or barge of large size and fitted with powerful engines, both for its propulsion and the movement of its dredging machinery. Just abaft the center of the boat, four holes are made in the bottom, and to these are fitted iron pipes, having flexible joints, so as to hang freely below the keel. These are joined together by a framework, and, by means of a crane at the stern they may be raised or lowered at will. Each pipe terminates in a bent shoe, having openings at its sides. When at work they rest lightly in the mud at the bottom, and, being flexible, readily adjust themselves to the changing depth caused by the waves, the tides or the shoaling of the water. Through these pipes is sucked up, by the natural pressure caused by the displacement of the boat, the loose mud and sand to be removed. It enters the hold of the boat under considerable pressure, and, by the aid of steam pumps, is thrown up through pipes to the deck, and thence onto board into barges alongside. Fitted with such tubes, each 10 inches in diameter, such a boat, it is estimated, will lift and discharge 32,000 yards of silt in 10 hours. With clean sand, an increase of 20 per cent. over this is estimated. This plan also presents another interesting feature in a machine for tearing up and loosening hard packed silt, and preparing it for the suction tubes. This consists of an iron fork or harrow, revolving on its own axis, and supported on a framework, lowered by chains from the bow. By this means it is kept at any required angle, and, by means of a chain belt, it is caused to revolve, and thus tear and rip up the bottom just in advance of the pipes. When at work the boat is designed to be advanced by means of a line of secured moorings and leaving a path on the bottom of varying depth, according to the character of the material. Each pipe sucks up a wide area about its mouth, and, in case of choking or stoppage, may be instantly cleared by raising the pipes from the bottom and allowing the clear water to sweep through. When not in use the harrow and pipes may be raised to the keel, and the boat then moved to another spot. This new dredging machine has been made the subject of exhaustive experiment, with satisfactory results.

BARON DE LESSEPS.—The man who made an international fame in carrying the project of the Suez canal to a successful completion, Baron de Lesseps, is pleasantly gossiped about by a correspondent as follows: Though 70 years old, he is still a young man, and contemplates grand designs which it is to be hoped he will live to carry out. With black eyebrows and mustache, but white beard, he is a most noticeable man, and those who do not know him take him to be a sergeant in the gards. He brings his children up in the most Spartan—or shall I say Egyptian?—way. They go about barefooted, and, although Madame only half likes this, he is able to boast that their young ones, of whom they have a small regiment, are never ill. His house is full of gifts from great persons. There is a gold cup given by the Empress worth \$40,000. All the sovereigns present or represented at the opening of the canal sent him ribbons, making him one of the most decorated men in Europe. He now desires to make a railway through the Euphrates valley. He says: "I do not care for riches, and I have no wants; all I wish is that my children may grow up and prosper. I satisfy myself with the hope that they will get on in life, proud of their father, and happy to continue his work, which is that of humanity and civilization."

FRENCH ENGINEERING PROJECTS IN AFRICA.—The vast engineering project of filling a depression in the Sahara desert by allowing the entrance of water from the Mediterranean, is still discussed in the French scientific journals. Mr. Honyvet remarks, in a communication to the French Academy, that it will not be difficult to establish this sea—the problem is how to keep it. Supposing the sea be established by means of a canal there must be an enormous quantity of water lost by evaporation. The water evaporated being replaced by a supply coming through the canal, the whole body will soon reach the maximum of saturation. This evaporation still continuing, a deposit of salt will be formed, which in time will fill up the whole space of the interior sea, the ultimate result being simply the accumulation of an immense deposit of salt. The advocates of the project are very strongly of this opinion, however—based upon this most painstaking and protracted investigation by eminent experts—that the presence of this water, and its evaporation, will produce copious rains, which will, in a great measure, return into the sea, and not only accomplish the object referred to, but also convert what is now a sterile waste into a fertile country.

GOOD HEALTH.

Sleep.

At the London Institution Professor Ferrier, of King's college, delivered a lecture on this subject before a large and deeply interested audience. Dr. Ferrier began by remarking that no living being is capable of continuous, uninterrupted activity. All work implies waste, and the possibility of continuous life and activity necessitates as a postulate the constant repair of the waste of action. During active work the process of waste is in excess of the process of repair; hence, if action is kept up a period comes when the stores of energy are expended. In action, rest or repose follows, during which the waste is repaired or made good, and the duration of this period of inaction will depend on the rate at which the process of repair progresses. During the period of inaction, or sleep of the muscle, the wasted tissues were again restored, the period of rest depending on the degree of exhaustion.

What was true of the muscle was true, *mutatis mutandis*, of the organs of digestion. Some organs seemed to be in a state of constant activity, and therefore might be thought to be exceptions to the general law laid down. This, however, was not so; for in reality these organs, the heart and respiratory organs, were not in a state of constant, but of rhythmical activity, a period of action being followed by a pause or rest. The only difference between the heart and the voluntary muscles was that the periods of action and inaction of the heart were short and followed each other in quick succession.

The brain, the organ of conscious activity, was kept in constant action during the day for many consecutive hours, and therefore it was necessary that there should be a correspondingly prolonged period of relaxation from action, and repair of the brain waste condition by all thought, solution, etc. The rest of the brain was sleep *par excellence*, but, in addition, sleep was the period during which the repair of the excess of waste over nutrition in the body generally occurred, in so far as it had not been made good during the day. This was proved experimentally by the researches of Pettenkofer and Voit, who showed that, in reality, more oxygen in the form of carbonic acid, etc., was given off during the day than was taken in, and it was during the sleep that the excess of oxygen was stored up as a reserve fund against the possible needs of the following day. The relation of the duration of sleep to the period of action and its modifying circumstances were also considered, and a parallel drawn between the average duration of sleep and rest of the heart. The physiological condition of active exertion on the part of any organ is an active circulation through it. The local increase of the circulation or local hyperæmia was brought about through reflex dilations of the blood vessels, effected by the organs or tissues themselves. Muscles in a state of action drew a much larger supply of blood than when quiescent; so, also, the stomach digestion. The same was observed in the brain during active thought. This had been demonstrated by direct experiment, and it was also shown, indirectly, by the fact that when a large amount of blood was drafted off to any one particular organ, there was an impoverishment of the circulation elsewhere. Hence deep thought, necessitating a large supply of blood on the brain, was unfavorable for digestion. Also, in deep thought, the circulation became feeble in the extremities, hence cold feet, etc.

In sleep the brain is anæmic. This has been shown by Durham, Hammond, etc., by way of direct experiment. This is proved also indirectly by the greater quantity of blood which circulates in the skin and extremities during sleep, because there is a greater radiation of heat from the skin. Whatever tends to abstract blood from the brain favors sleep. Hence digestion tends to cause sleep, as do hot drinks, etc., by drawing the blood supply from the brain to the stomach. Conversely, whatever tends to keep up the activity of the brain cells and the circulation, tends to prevent sleep. This, therefore, is the effect of any stimulus applied to the senses, sights, sounds, thought, anxiety, etc. The opposite favors sleep. Hence night is the period of sleep, because sources of disturbance or stimulation of the organs of sense is diminished or altogether lulled.

HOW TO MAKE RAW MEAT PALATABLE TO INVALIDS.—The following recipe for this purpose has been given by Iyon:

Raw meat (from the loin) 250 grammes (8.7 oz.)
Shelled sweet almonds, 75 grammes (2.6 oz.)
Shelled bitter almonds, 5 grammes (.17 oz.)
White sugar, 80 grammes (2.8 oz.)

These substances are to be beaten together in a marble mortar to a uniform pulp, and the fibers separated by a strainer. The pulp, which has a rosy hue and a very agreeable taste, does not at all remind one of meat, and may be kept fresh for a considerable time, even in summer, in a dry, cool place. Yolk of egg may be added to it. From this pulp, or directly from the above substances, an emulsion may be prepared which will be rendered still more nutritious by the adding of milk. Lailler prefers the following preparation:

Dried raw meat, 100 grammes (3.5 oz.)
Sugar, 40 grammes (1.4 oz.)
Wine, 20 grammes (.7 oz.)
Tincture of cinnamon, 3 grammes (.1 oz.)

It is a kind of electuary, very agreeable to the palate.—*Industrie Blatter*.

UNDER AND OUTER GARMENTS.—Woolen stuffs are the best materials for clothing in every climate. In warm countries at noon-day, when the vertical rays of the sun strike down in their greatest intensity, the want is to keep the heat out, and a bad conductor is as useful there for this purpose as it is in the Russian snows to keep the heat in. The old lady with her wraps of shawl and fur-lined hood, wending her way to her whist party in St. Petersburg, on a December night, has a strange counterpart in the gallant young officer mounted on his Arab steed, with his head enveloped in turbaned shawls six inches deep, traversing the plains of Hindostan under a burning sun in the month of June; yet both are practical philosophers, despite the blow-blot and blow-cold objection. Hence, also, the flannel costume of the stokers in ocean steamers, who are exposed to intense radiating heat, and they are in this way enabled to bear and resist it; whilst we prevent or check the melting of ice by wrapping it in flannel or straw. White is the best color for protection against both heat and cold; and prominence should be given to this inculcation of the hygiene of dress.

BEST ANIMAL FOOD.—In a recent work on different foods, physiologically considered, the author argues that the best animal food is the flesh of the sheep, and the best vegetable food that of or from wheat. The variety and proportion of the ingredients in a pound of wheaten flour furnish a fair evidence of the value of this grain as a general aliment: Water, 2 ounces, 106 grains; gluten, 2 ounces, 21 grains; albumen, 126 grains; fat, 84 grains; fiber, 119 grains; ashes (salts), 112 grains. Ingredients such as these, in the proportions peculiar to wheat, are admirably adapted to maintain the human body in health and vigor.

LIME JUICE AND PEPERINE.—Dr. Farr, of London, has started the idea of administering pepsine in cases of dyspepsia, in conjunction with lime juice. He believes that the anti-scurbutic value of the latter is due to its power of dissolving certain portions of food; and having regard to the fact that the gastric fluid invariably contains acid of one kind or another, he concludes, not unreasonably, that the acid may perhaps claim some credit in promoting the digestive process.

USEFUL INFORMATION.

How to Lay Shingles.

Not one-half the persons who lay shingles when making a roof on a building have any correct ideas in regard to making a roof that will be absolutely "rain-tight" during a driving storm of rain. We have frequently seen men shingling, who, when they would meet with a worthless shingle, say once in laying two or three courses, would lay this poor shingle among the good ones, saying: "It is only one poor shingle—one shingle cannot make a poor roof." But one poor shingle will make a leaky one. If first rate shingles are employed and one poor one is worked in among every 100, that roof might about as well have been without any shingles. If any poor shingles are to be used let them all be laid together near the upper part of the roof. The best of shingles will not make a tight roof if they are not properly laid, while the same shingles would make an excellent roof if laid as shingles should be laid.

The correct rule for laying shingles of any length, in order to form a roof "leak-tight," is to lay the courses less than one-third the length of the shortest shingles. For example, when shingles are 18 inches long many of them will not be more than 17 inches in length. Therefore, five inches is all that the courses will bear to be laid to the weather with surety of forming a good roof. The shingles must be three thicknesses over the entire roof. If they are not three thicknesses—if now and then a shingle lacks a quarter or half an inch of being long enough to make three thicknesses—there will, in all probability, be a leaky place in the roof at such points. Moreover, when the lower courses lack half an inch, or even a fourth of an inch, of extending up far enough to receive the rain from the outermost course, in case the middle course were removed, it would be just as well to lay them seven or eight inches to the weather as to lay them only five, or five and a half inches. Many shingles are only 16 inches long, and many that are sold for 16 inches long will hardly measure 15 inches. In this case, if the roof be rather flat—say about one-quarter pitch—four and a half inches is as far as they should be laid to the weather. In case a roof were quite steep it might answer to lay the courses four and three-quarter inches to the weather.

When buildings are erected by the job, proprietors should give their personal attention to his subject, and see that jobbers do not lay the courses a half inch too far to the weather.

There is another important consideration which is too frequently overlooked in shingling, which is "breaking joints." Careless workmen will often break joints within half an inch of each other. When the joints of the different courses come so close together the roof will most certainly leak. Why should it not? There is nothing to prevent it during a heavy rain. Unless a roof is steeper than a quarter pitch much care should be taken to break joints not less than one and a quarter inches. Let all workmen and helpers be taught the vast importance of rejecting every poor shingle, except when the upper courses are being laid.

Cleaning Mercury.

Mercury is much used in various physical and chemical experiments, and frequently becomes so dirty and impure as to render it unsuitable for many purposes.

The impurities may be divided into three classes; first, mixture with metals, especially lead, zinc and tin; second, common dust and dirt; and third, water or other liquids.

Redistillation is almost the only way to remove the metals, and even this is not perfectly effectual in the case of zinc. The mercury used for amalgamating battery plates should, therefore, be kept separate from the rest, and used for this purpose only.

If but little of the metal is present, it may be removed by agitation with dilute nitric acid. Instead of nitric acid, a solution of nitrate of mercury may be used.

A great variety of devices are used to remove the mechanical impurities of mercury. It may be poured into a bag of chamois leather, which is squeezed until the mercury comes through in fine globules; or it may be poured into a funnel provided with a filter paper, in which a needle hole has been pierced.

Mercury may be washed directly with water, by shaking them together in a bottle, or filling a jar with mercury and allowing water to bubble through it. To ascertain if mercury is pure, it may be poured into a porcelain evaporating dish. If lead is present, it will tarnish the sides. A thin film will also, after a time, form on its surface, due to oxidation; zinc and tin produce a similar effect. The surface of mercury when at rest should be very bright and almost invisible, and small globules, if detached, should be perfectly spherical, and not adhere to the glass, but roll over it freely when the surface is inclined.

UTILIZATION OF THE SUDS FROM THE WASHING OF WOOL.—In nothing has the advance of practical science been more clearly evidenced than in the extent to which substances formerly wasted and lost are now reclaimed and made to constitute an important element in the profits of the manufacturer. One of these applications consists in the recovery of the soapsuds from the washing of wool in woolen factories. These were formerly allowed to run down the sewers and into the streams, to the great pollution of the latter; but in Bradford, England, they are now run from the washing bowls into vats, and there treated with sulphuric acid. The fats rise to the surface in a mass of grease a foot or more in thickness, which is carefully collected and treated in various ways, mostly by distillation. The products are grease, used for lubricating the cogs of driving wheels in the mills; oleic acid, which is worth about \$160 per ton, and used as a substitute for olive oil; stearine, worth \$400 per ton, etc. It is said that some large mill owners are now paid from \$2,500 to \$5,000 a year for these suds, which a few years ago were allowed to run to waste.

TAR WALKS.—A correspondent recommends the following mode for making tarred walks: First gravel the walk in the ordinary way, but do not give it so thick a coat as usual; beat well down to make a perfectly smooth and even surface, which coat well with tar. When this is done put the final layer of gravel on the top, three-quarters of an inch to one inch will be quite sufficient, and again beat down, using the back of a spade for the purpose. The walk so prepared must not be trodden upon for two or three days, at the end of which time it will have become perfectly hard, and will not be affected by the heaviest fall of rain. The work must be done in fine weather, and the plan will be found better than using cement mixed with gravel.—*English Mechanic*.

SHAM COFFEE.—We learn from a statement in the *Journal of the Chemical Society* that sham coffee is manufactured from tough dough, squeezed into little molds and baked until the color becomes dark enough to deceive the eye. Real coffee berries, when small and worthless, are improved in color by rolling them about with leaden bullets in a cask. The green berries, too, are treated by a coloring matter. In coffee sold really ground, the difficulty of detecting adulterations is greatly increased; beans, beet root, carrots, and carrot-like roots are roasted and mixed in large quantities with the genuine article. In the south of Europe, especially in the provinces of Austria, figs are roasted in enormous quantities and sold as coffee.

COW HAIR AS A SUBSTITUTE FOR WOOL.—There is now being manufactured in England a class of goods known variously as velvets, Ulster coatings, chinchillas, etc., alleged to be made of hair and vegetable fiber, without the admixture of wool in any shape. These goods are finding their way into the United States, and the custom house authorities are not a little puzzled as to where to place them, when scheduling them for duty. Testimony of experts was called in; but it was only another case in which "doctors disagreed." The solution of the problem has been made the duty of the National Academy of Sciences.

SAVE YOUR SOAPSUDS.—Who would throw away a barrel full of soft soap or a box of hard soap? Were it not otherwise useful, it would be of great value as a fertilizer. But, after being dissolved in water and passing through the wash tub, gleaming the imperceptible elements of the best manure from soiled linen, its fertilizing power is vastly increased. Indeed, we may almost say that the average soapsuds from the kitchen and laundry is worth more than the soap which produces it.

DOMESTIC ECONOMY.

FANCY MATS FOR FLOORS.—Take a piece of canvas, of size desired, such as coffee sacks are made of. Cut a quantity of black and colored cloth in circles of various sizes, making sufficient, when one is laid on top of another, to cover the entire mat. Sew the large lower ones down on the canvas, and the upper ones keep in place by taking four stitches from the center across each side, using coarse colored cord or twine; finish by making tufts of ravelled carpet, yarn, or zephyr on the top on the top of each cluster of circles, using various bright colors. To make these, pass a strand up through the center, and winding a quantity around two or three fingers or a piece of card, lay the bunch across the top of a circle, and passing the needle and strand down through it again (near the spot where it was drawn up), pull it firmly down until the tuft is drawn together, when fasten by taking a stitch or two on the under side, and proceed to the next circle. When all are done clip the tufts into round half balls or battons. These mats may be made of old cloth, and are not only very handsome but durable. Another good mat is made by taking a piece of Brussels or ingrain carpet for a center, then finishing with a border of cloth of any and every description, plaited together in broad bands, and sewing this long piece and braided strip round and round the mat until of desired size. Coffee sacks, worked in with coarse yarn or strips of bright cloth, making figures, flowers, etc., are really handsome when carefully done.

A HOME-MADE CARPET.—An Eastern lady says: Have any of you a spare bedchamber, seldom used, which you would like to carpet at little expense? Go to the paper-hanger's store and select a paper looking as much like a carpet as you can find. Having taken it home, first paper the floor of your bedroom with brown paper, or newspapers. Then over this, or these, put down your wall paper. A good way to do this will be to put a good coat of paste upon the width of the roll of paper and the length of the room and then lay down, unrolling and smoothing at the same time. When the floor is all covered, then size and varnish. Only dark glue and common furniture varnish may be used, and the floor will look all the better for the darkening these will give it. When it is dry, put down a few rugs by the bedside and before the toilet table, and you have as pretty a carpet as you could wish; a carpet, too, that will last for years, if not subject to constant wear, and at a trifling expense. I myself used a room one entire summer prepared in this way—used it constantly; and when the house was sold in the fall, the purchaser asked me to take up the oil cloth, as he wished to make some alterations which would be sure to injure it.

BE ECONOMICAL.—"Take care of the pennies." Look well to your spending. No matter what comes in, if more goes out you will always be poor. The art is not in making money, but in keeping it. Little expenses, like mice in a barn, when they are many, make great waste. Hair by hair, heads get bald; straw by straw, the thatch goes off the cottage; and drop by drop the rain comes into the chamber. A barrel is soon empty if the tap leaks but a drop a minute. When you mean to save, begin with your mouth; many thieves pass down the red line. The ale jug is a great waste. In all other things keep within compass. Never stretch your legs further than your blenket will reach, or you will soon be cold. In clothes, choose suitable and lasting stuff, and not tawdry fineries. To be warm is the main thing; never mind the looks. A fool may make money, but it takes a wise man to spend it. Remember, it is easier to build two chimneys than to keep one going. If you give all to back and board, there is nothing left for the savings bank. Fare hard and work hard when you are young and you will have a chance to rest when you are old.

WASHING DISHES.—A housekeeper makes the following suggestions: I have large dish pan, small dish pan, and a basket made of ordinary splint. It is two feet long, a little over one foot wide, ten inches high, strong sticks across the bottom, and handles at the ends. After placing the old sack in the bottom of my basket, I pat over it a crash towel and turn down my dishes in the basket; cups at the ends, plates in the center, and covered dishes, glass, etc., on top. Finish all my other work, as suggested, and take my basket to the china closet, near the shelves. I go over them slightly with a linen towel, and they shine like—well, washed china. My basket was made by a Canadian 15 years ago, and cost me 50 cents. I could not wash dishes without it. Think of the steps it has saved me in that time. Besides drying the dishes in it, I often place all my dishes for setting the table in it and carry in one journey to the table.

APPLE FLOAT.—A pint of stewed, well mashed apples; whites of three eggs, four large spoonfuls of sugar, beaten until stiff; then add the apples and beat all together until stiff enough to stand alone. Fill a deep dish with rich cream, boiled soft custard, and pile the float on top. This is excellent with other fruits in place of apples.

GOLD CAKE.—Two cups of flour; three-fourths of a cup of butter; one egg and the yolks of eight eggs; two spoonfuls of baking powder.

MINING SCIENTIFIC PRESS

W. B. EWER.....SENIOR EDITOR.

DEWEY & CO., Publishers.

A. T. DEWEY, OEO. H. STROGO
W. B. EWER, JNO. L. BOONEOffice, No. 224 Sansome St., S. E. Corner
of California St., San Francisco.

Subscription and Advertising Rates:

ADVERTISING RATES.—1 week. 1 month. 3 months. 1 year.				
Per line.....	25	80	\$2.00	\$5.00
One-half inch.....	\$1.00	3.00	7.50	24.00
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THE ORIGINAL ARTICLES in this paper are mostly as in solid type, giving columns one-third more reading than is contained in ordinary leaded matter.

Our latest forms go to press on Thursday evening.

San Francisco:

Saturday Morning, April 29, 1876.

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PERKINS' PATENT SELF-REGULATING WIND-MILL has now been in use some five years in California, and is highly recommended. Israel Horton, the general agent for this co. st. at Livermore, has been busy in disposing of them in large numbers in the San Joaquin valley and other adjoining districts of California, and has not hitherto introduced them through the Press to the general farming public of the State. On a recent visit to Livermore, we found Mr. Horton to be a well established business man, and we expect to see his already successful business extended to various new parts of the State. His windmills have taken the premium at both the San Joaquin Valley agricultural fair at Stockton and the State fair at Sacramento. Persons wishing windmills are referred to Mr. Horton for his illustrated circular.

A MINER named Samuel Mugford was instantly killed last Friday afternoon while at work in the Garfield mine, near Amador City. Deceased was a native of England and 42 years of age. He leaves a wife and five children.

The famous Bowers mansion, in Wasboc valley, near Frankton, will be sold at public auction on the 3d of May next. Evidently the propheying business has not paid Mrs. Bowers, says the Virginia Chronicle.

PARK still declines to answer questions as to the amount realized by him in the Emma mine transaction, and the committee are divided in opinion as to their amount.

BARNEY WILLIAMS, the well known actor, is dead.

Railway for Transporting Freight.

Phineas Benning, of Wilmington, Los Angeles county, has recently patented through the SCIENTIFIC PRESS Patent Agency certain improvements in railways and the carriages employed thereon, by which he is enabled to lay a line of road and operate it over a country where but little grading is necessary, so cheaply that it can be made available for the transportation of freight, lumber, and in some cases passengers, in thinly settled districts where an ordinary line of road would be too expensive. It consists mainly in a peculiar construction for a permanent way and for the carriages which are to run thereon, and merits a detailed description as a novelty in engineering.

The improved road is designed to be constructed where timber is plenty, and for this purpose a portable sawmill may be first taken into the forest, where the lumber is cut into planks about three inches thick and of any suitable width—fifteen inches in width where the timber will serve, and of any length; these serve as a track when laid. Similar timbers are also cut of such a length as to answer for cross-ties. Usually these can be made of the outside slabs sawn from the logs, and they are laid upon the road bed, which is then filled up with earth and tamped, so as to be level with these ties. About 2,000 of these ties may be employed per mile, and the planks are then laid two in width, side by side, and breaking joints, so that the track when laid will present a solid surface from 20 to 30 inches in width. The lumber of the track should be properly out, so that when laid the grain of the wood will stand nearly vertical, to reduce the wear to a minimum.

The carriage which is intended to be used in combination with the road is made in any form suitable for the load it is to transport, and is mounted upon trucks. The wheels or rollers which are employed are of peculiar construction, and are intended to be employed especially in combination with this peculiar road. These rollers may be made of wood or iron, and have flanges at their outer edges by which they are prevented from leaving their track. The axles of these rollers may be extended so as to carry cranks beyond their journals, and the driving engines will be connected to those cranks in any suitable manner, so as to drive them.

It will readily be seen that in some cases the drivers or rollers might be made in pairs upon the same axle, and sufficiently separated to allow the cranks to be formed between them, but slight modifications of this sort will readily suggest themselves to those who construct the road. It may be found desirable in some cases to cover the rollers with rubber or other elastic substance.

The rate of speed to be allowed will be low, and the road is only intended to be constructed over sandy or heavy land, which is tolerably level, and to be graded at a low expense, and where the expense of a wagon or railroad would be large. If a pine forest is easily accessible at either end or near the proposed line the lumber can be procured at from five to ten dollars per thousand feet, and by utilizing the outer slabs of the logs for the cross-ties, about fifty or sixty thousand feet per mile will be amply sufficient for the construction of the road, which would then cost only from three to five hundred dollars per mile, exclusive of rolling stock, etc. If desired, the road when finished may be coated with asphaltum or suitable material, but this is not essential to its success.

UNFORTUNATE CHEMICAL EXPERIMENT.—In September, 1870, while Professor Thomas Price was lecturing under the auspices of the Mechanics' Institute, in this city, an explosion of certain gases took place. The Professor and his assistant were severely burned, and one W. L. Urton, a spectator, had his eye put out. He sued Professor Price for \$25,000 damages, asserting that the accident occurred through his carelessness or ignorance. The suit has been pending for a long time and has excited considerable interest, but a decision was arrived at this week. The jury brought in the following finding: That the defendant was the servant of the Mechanics' Institute and not responsible; that he had not used all the precautions against action now known. On the latter point the court sent the jury back to determine whether the defendant had or had not used all the precautions against accident known at that time. The jury then retired and after two hours' deliberation returned a verdict for the plaintiff, and assessed the damages at \$500.

A RIDE TO NEVADA CITY.—We are indebted to Mr. Chas. Barker and lady, of Grass Valley, for a pleasant ride between the above named places. Prominent evidences of improvements were observed on the route, including the Fryer reduction works and the Gold Race-track homestead, lately purchased by the Fryer Co.; V. flame company's terminus works on the divide, near the narrow gauge tunnel. The Idaho mine, under the superintendence of Mr. Coleman, is hoisting, crushing and successfully reducing between 500 and 600 tons of ore weekly, with as little noise and friction as any well regulated quartz mill and company can get along with. Nevada City still holds its leading position as one of the finest and most permanent mining and business towns in the State.

Paul's Dry Process.

This process and machinery connected therewith, on which Mr. Paul has now secured some eight patents, the 1st of which was issued through the SCIENTIFIC PRESS Patent Agency some weeks ago, is finally to be practically illustrated in San Francisco by a mill of a capacity for testing ores by the ton. Unlike most new processes, which generally start in the city and die out in the mountains when they are put to the test of practical operations, this has been fully perfected, Mr. Paul tells us, through the working of thousands of tons by large mills. Taking these facts, together with Mr. Paul's 25 years or more of practical experience in gold and silver mining, we feel safe in saying that this mill will be worthy the examination and attention of all engaged in quartz mining. Mr. Paul's claims for his system have been very broad and fully proved up, publicly, as he now proposes to do, there is certainly a great future for our gold quartz mining interest. Mr. Paul's claims, among others, are as follows:

That it will work gold ores and gather flour gold with the same readiness as the coarser, whether free or associated with iron, copper, lead, antimony or zinc, or all together in one matrix, and produce bullion free of any or all of the base metals, less natural alloys.

That it will produce from 10 to 100 per cent. more metal than any known system of amalgamation working at the same expense.

That where silver is associated with a large percentage of lead, copper, zinc or antimony a certain percentage can be extracted in fine bullion—the percentage owing to ore—say from 20 to 85 per cent. The residue in base metals can be taken up by concentration, at no additional expense except for machinery.

That it will work silver ores carrying any of the base metals to a higher percentage than any system of raw amalgamation, and produce bullion 950-1000 fine.

One of the most remarkable features of this system of dry amalgamation is that no base metal is taken up with the precious under any circumstances.

A CENTENNIAL QUARTZ MILL.—John Reardon & Co. have nearly completed, at the Union Iron works, Sacramento, a very complete model quartz mill, which they intend exhibiting in various cities in the Union and at the Centennial. The stamps are of one-third the usual diameter, with all other fixtures of corresponding size. It comprises four batteries of five stamps each, sluice blankets, amalgamating plates, boxes, grinding and settling pans, etc., forming altogether a novel but complete working mill. It is accompanied by a very neat two horse-power engine. We expect to give further particulars of Mr. R.'s plans soon. The same foundry recently received an order for a first-class ten-stamp mill for a mine in Plumas county. The works are fairly busy on agricultural machinery and general jobbing. Among the recent California inventions machines constructed in part by the proprietors, is Miller's new hay press, for which Marcus C. Hawley & Co. are agents.

STAGE CHANGES.—On Monday of last week the narrow gauge railroad relieved the faithful drivers and wearied horses on the stage line between Grass Valley and Colfax. Mr. C. J. Shaw, who has been the active agent of the line at Colfax since 1865, will also take a rest. He informs us that the year before the narrow gauge was determined upon 10,005 passengers went over the road to Grass Valley and Nevada. During the flush times of travel on the route he estimates the number of passengers as high as 20,000 in a single year. Over 70 Chinamen are now at work on a new stage road from Colfax to Yankee Jim's, over which passengers will be taken for Todd's valley, Forest Hill and Michigan Bluffs, perhaps as early as July next. This will shorten the stage route to Yankee Jim's one-half. This will add again to the stage business of Colfax.

TELLURIDES.—At the last meeting of the San Francisco microscopical society, Dr. Jas. Blake presented a slide, mounted with gold, which he had obtained from so-called telluride of gold, by treating with acid. The telluride was obtained from the American mine, Sunshine district, Colorado, and showed no gold before the application of acid, and Dr. Blake stated his belief that the pure gold was simply concealed by a superficial coat of tellurium, which was a decided case in favor of the assumption by Mr. Hanks, which he had offered at a former meeting, that there was no chemical compound of gold found in nature, or, in other words, as he then stated in his paper on "Micro-Mineralogy," "the results of my microscopical examinations cause me to doubt if gold ever becomes mineralized, in the strict sense of the term."

LIBERAL TERMS FOR CITY REAL ESTATE.—We would call especial attention to the advertisement of real estate at auction in Oakland in today's issue. City and country residents who wish to secure lots in Oakland at extreme low and favorable rates should not let the chance of securing property in that desirable city pass. Examine the property and be prepared to buy when the day of sale comes.

Gems and Precious Stones.

(Written for the Press by HENRY G. HANKE.)

(Continued from last week.)

Diamond cutting not only requires great skill and judgment, but also requires the outlay of considerable capital. The largest establishments for this branch of industry are in Amsterdam. In the year 1872 I visited the works of M. & E. Coster, in that city, and saw the whole operation. The building is a large brick structure, every part of which is devoted to some branch of the trade. A beautiful and powerful engine in the basement drives the machinery. Vertical shafts pass up to the top of the building, and from these the grinding discs are geared.

I was first shown the room where the diamonds are kept for safety, and had the opportunity of seeing some fine stones. From this room I was shown to another where the stones are split. This is a curious and delicate operation. Only workmen of great experience are allowed to attempt this work.

The rough diamond is taken up by one of the workmen in this room, who studies it carefully, calculates mentally what parts can be removed without detracting from the value of the stone, keeping in mind the rule already stated, that the value of a rough diamond is only that of the largest doubly truncated octahedron that it will make. All excess must be removed. It is a great advantage to split off fragments, for the double reason that, the larger fragments may be cut with profit into small stones, to set around opals or pearls, and because it is a great economy of time, as the grinding down of the stone is a slow and tedious operation. It sometimes becomes necessary to remove flaws by this operation.

The workman is well aware of the fact I have already stated, that the cleavage of the diamond is four-fold, and takes every advantage. It is astonishing to witness the skill with which they perform this operation. A workman cements the stone to a piece of compact wood by means of a strong cement, leaving the portion to be removed exposed. To this end he fashions the cement with his fingers while still soft, then with a fragment of another diamond he makes a deep scratch along the line of cleavage. Then, after wrapping the stone in loose folds of cloth, he applies a steel rule or knife edge, with a gentle and skilful blow with a light rod of steel he breaks off the portion he wishes to remove with unerring certainty.

From the hands of this workman the stone passes to another in another room, who continues the operation by cementing it again to the end of a stick and taking another diamond of equal size, also cemented in the same manner to a stick; he rubs the two together until he produces the proper facets on each—each grinding the other down, literally "diamond out diamond." The workman to whom this operation is entrusted wear heavy leather gloves. The powder resulting from the abrasion is carefully collected in a box, in which oil is kept which collects the dust and prevents it from being blown away. When sufficient has collected the oil is burned away, leaving a gray powder called "bort," which is more finely powdered and used to polish other diamonds. During the operation of grinding the workman frequently touches the stone to his tongue to see how the operation progresses; first, however, removing any adhering diamond dust with a camel hair brush. This work does not form all the facets of a perfect stone.

The next and last operation is that of polishing the rough cut stone and of cutting away some of the edges, producing a new set of facets, due to a perfectly cut brilliant.

The polishing is done on discs of iron or steel. These wheels are about three feet in diameter and rotate horizontally. They move with great velocity, making 2,000 revolutions in a minute. They are so true and run so smoothly that at first glance they seem like stationary tables, sustained by the vertical shafts. It requires some skill and labor to prepare the surface of these discs to render them suitable for receiving the diamond powder. Stones of varying fineness are used in such a manner as to leave striations on the surface, something like that of the barr mill stone, but very much finer. A mixture of diamond dust and olive oil is then placed on the face of the disc, which is called a "skaif." The workman then takes a brass tripod, of which one arm is longer than the others; in the end of this longer part there is a socket, which he fills with melted solder, into which, as it cools, he imbeds the stone, leaving the face only exposed which he wishes to polish. When the solder is perfectly cold and hard he turns the stone down on the revolving plate, allowing the shorter arms to act as a claw to hold against the friction of the wheel. He then puts weights on the end of the tripod above the stone. These are heavy or light as the face is large or small.

The Amsterdam establishment employs from 500 to 600 persons, who are mostly Jews.

An establishment for diamond cutting has lately been started in New York, under the name of the New York diamond company.

For many years diamonds have been cut and polished in Boston, and quite recently the English have turned their attention to the art they once excelled in. An African diamond has just been finished in one of these works which is highly spoken of. It is said to be a most magnificent stone.

The Kohinoor was cut in London, but by some of the skilled workmen from Amsterdam.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s Scientific Press American and Foreign Patent Agency the following are worthy of mention:

GUARD FOR SHAPING MACHINES.—Marquard Hansen, S. F. The object of this invention is to provide a fender or guard for protecting the hands of workmen from being cut or mutilated by the shaping machines which are used for shaping and trimming pieces of wood. These machines consist of two or more horizontal blades secured to an upright shaft just above a table or bench and rotated at a high rate of speed, so that it is often impossible to distinguish the blades or cutters; consequently workmen are frequently injured or maimed by bringing their hands in contact with them. This invention is a guard or fender which can be adjusted so as to permit the workman to use the machine without danger of bringing his hand in contact with the cutters. In the upper face of the table, at a proper distance from the shaft, is snubbed a curved metallic plate so that the shaft will be the center of the curve and therefore equidistant from every part of it. In this plate are bored two or more holes at suitable points, and these holes are tapped with screw threads. A post is made with a screw on the lower end which will fit into either of these holes. A horizontal bar is then taken, provided with a hole of sufficient size to allow it to slip down upon the post, so it can be fixed at any desired point by a set screw, while the other end is formed into a ring which slips down over the upright cutter shaft. A fender band or guard is secured to this horizontal bar so as to encircle the shaft and cutting blades. This band is adjustable back or forth by being attached to the bar in the manner of a slide, so that part of its circumference which is opposite the slide can be moved to or from the rotating cutters and thus not only gauge the block of wood to be trimmed, but also protect the hands of the workman from being cut by the cutters. The band can easily be raised or lowered. Should the screw post be in the way of the workman, it can be shifted to different holes and thus prevent the device from interfering with the work. This gauge and guard is quite simple in construction and will effectually protect the hands of workmen from this heretofore dangerous machine.

DOUBLE BEARING BRIDGE FOR PIANOS.—Jacob Zech, S. F. This invention is an improvement in the construction of pianos, and consists in a novel bearing bridge, in which Mr. Zech forms a continuous and solid bearing for the strings, and so secures it to the wrest plank that it is entirely free from contact with the iron frame of the instrument. By this construction he avoids, first, the use of a number of separate pins or supports for the strings, each of which must be separately secured; and, secondly, he does away with a disagreeable tone which is produced by the necessity of securing these separate supports to the iron frame itself. The improvement consists in the use of a continuous brass plate, having projecting lugs at suitable intervals, through which angular holes are bored to receive the strings. This plate may be made of any length suitable for the positions which it is designed to occupy in the instrument, and is formed with the front of the plate extending down the face of the wrest plank, to which it is securely fastened. A projection is formed with this plate and extends back at right angles with it beneath the frame. An arrangement is also made so that there will be no contact between the bridge or any portion of it and the frame. By this construction Mr. Zech claims to greatly improve the tone of the instrument, and is enabled to make a solid and substantial bridge which is of superior durability to the present method.

IMPROVEMENTS IN PLOWS.—Jas. T. Watkins, Santa Clara. This improvement in plows consists in constructing the share and landside in one single piece and in providing a simple and extremely effective means for attaching it to the standard and mold board, so that the share and landside can readily be removed for sharpening or other purposes when desired. It is not new to make the share and landside of a plow in one single piece and secure them by means of bolts to the mold board and standard. Neither is it new to make the share so that it can be attached to the mold board and detached from it without the use of bolts; but this invention differs from both of these devices. A detailed description of the improvements would not be intelligible without the aid of engravings.

PROCESS FOR CURING TOBACCO.—John R. Opitz, Anaheim, Los Angeles county, Cal. This is a novel process for curing the leaves of tobacco without removing them from the place where they are grown, and without transferring them to drying houses. The inventor calls it the "California underground process." He claims that tobacco cured by this process will be found with unbroken leaves and as soft as silk, while it will be of a very even color. Moisture enough will be found in each leaf to steam and assist in curing it and the covering of each will prevent the sun from burning it. The earth also has the property of extracting from the leaves a certain unpleasant and bitter

flavor which is found in many kinds of tobacco, and by other means the juices from the stalk are prevented from running down into the leaves, as happens in drying houses. By this method all cost of drying houses and much of the cost of gathering and transporting the leaves and the consequent tearing of many of them will be avoided. The expense will be reduced to fully one-half what it is by the old process. The process is especially valuable to countries which have rainless seasons and may be there employed, as there is no danger of spoiling the tobacco by dampening.

IMPROVEMENT IN SHOES.—Conrad Glanville, S. F. This invention relates to no improved mode of forming welts and stays for protecting the seams on boots and shoes, and it consists in utilizing the single edges of a doubled welt so as to make them serve as stays on the outside of the seam. The seam to which this welt is applicable is the manufacture of boots and shoes is when two raw edges are to be united together. Instead of using a single thickness of leather to form the welt, this inventor takes a strip of leather, cloth or other material of which the welt is to be made, and folds it double lengthwise; and in applying it he places the doubled strip between the edges to be united, and sews it in place so that its doubled edge will project slightly on the outside, while its single edges are on the inside of the seam. He then folds the single edges of the stay piece in opposite directions, and sews them down by a row of stitches on each side of the welt so that their inside edges will form a stay for the seam. An independent stay piece can be used if desired, but when it is used the inventor places it over the inside of the seam after the edges of the stay piece have been folded back; and the same row of stitches which fastens the edges of the stay piece down will serve to secure both the independent stay piece and the edges of

The Black Hills Fizzle.

"The latest reliable news from the Black hills is that nine Montana miners, who have been working steadily in the hills for the past six months, have averaged just \$10 per month to the man, having taken out \$540 for their six months' labor." This is the class of items one sees going the rounds of the press now-a-days, and they are somewhat different from those which appeared six months since. We are happy to remember that we never fostered the excitement in the least, but advised our readers to stay at home if they had anything at all to stay for; but at all events to wait. The evidence is accumulating that the Black hills country, as a mining region, is a fraud. The traders of Cheyenne have kept up the excitement as long as possible. The truth is now pretty well ascertained, in spite of preventive efforts. This is not by any means the first instance where the traders and carriers have kept up similar excitements, but in this instance the thing was well worked up.

It is now stated that the authorities at Fort Leavenworth are believed to be in possession of information which, if made public, would stop all emigration to the Black hills. Great trouble by Indians is apprehended. About 10 days ago three wagons were found at the entrance to Buffalo gap, on the Yankton route to the Black hills, nearly destroyed. The stock was gone, the wagon covers had been shot to pieces and the material which the wagons had been loaded with was lying around, some with marks of balls on them. Indians had evidently attacked and destroyed the entire outfit. Another dispatch from Fort Laramie says a party of immigrants were attacked by Indians on the 16th inst., near Cheyenne River rancho, about 50 miles from Custer. A few of the party escaped

An Improved Quartz Mill.

In a recent issue of the Press we mentioned that Messrs. Cowles & Cooper, of Sacramento, were building several of the improved California Giant quartz mills, which would shortly be in operation on mines in this State. As the mill possesses some new features, we herewith describe it in detail, with an illustration. The engraving is not our own and is not so fine as desirable; moreover, since it was made some slight changes in construction have been introduced, but it will serve to give the reader a better idea of the machine than a mere verbal description. Probably at some future day we shall give a more complete drawing by our own artist.

The mill itself is an improvement of the old Mexican alastra and the Chilean mill, by which means both a crushing and grinding of the quartz is effected and the defect of much loss of power is avoided. The power is applied to the periphery of the crushing wheel instead of the center, an improvement which any one can see the importance of.

In the mills now being built the crushing wheel, marked C, in the engraving, is 12 feet in diameter and 18 inches wide.

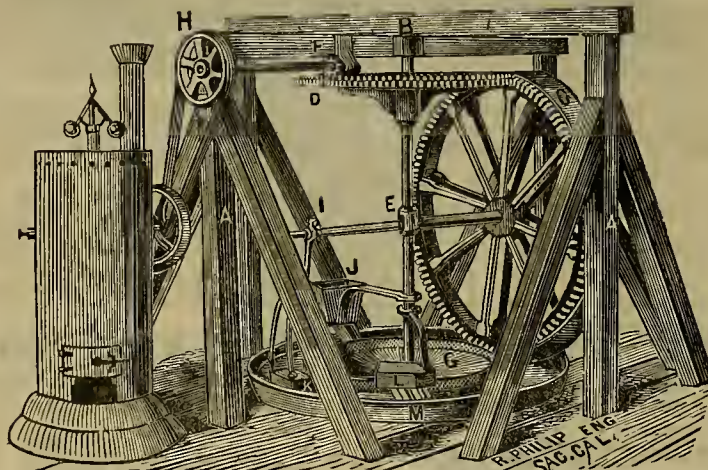
Three-inch hard iron plates are firmly bolted to the periphery of the wheel, the whole revolving around in a sectional iron disk or pan, M, which is securely bolted to the flooring. The wheel, C, is kept in its revolving course by the horizontal shaft passing through an elongated slot in upright post, E, which post revolves into a suitable step or bearing, in the center of amalgamated plates, G. The horizontal shaft passing through crusher wheel, C, is properly secured by a washer with a set screw to keep said wheel to its center, and prevent its going out of its regular course. The upright post, E, is also connected at the top by passing through a boxing on the cross beam, B. The power is communicated from the engine, or other power, to the fly-wheel and shaft, H, with its geared pinion to the gears on top of the crown wheel, D, on the side of which is another set of gearing which meshes into the gearing on the crusher wheel, C; thus making a compound leverage in the application of power. As the manufacturers have a 12 foot leverage from top to bottom of the crushing wheel, eight and a half feet the diameter of the crown wheel, eight inches in the diameter of the pinion and a four foot leverage in the driving wheel, by applying the power on this principle they claim to be able to crush 35 tons per day of hard flint quartz, with from six to eight horse-power.

The crushing wheel weighs, when complete, 12,000 pounds and the whole machinery is placed upon heavy trestle work. In rear of the crusher wheel, C, steel plows, L, are placed at convenient intervals, which stir the pulp in the pan, M, to prevent packing, and to more effectually allow the water, with the aid of the wash board, K, to carry off the superabundant pulp which may collect in the pan, M, through the screens on to the amalgamating plates, G. The wash board, K, works on the principle of a huge hinge in the bottom of the pan, M, by rods running up to the horizontal shaft passing through the crusher wheel, C, which motion is produced by a ratcheted cam on the shaft, relieving the mill of its pulp much quicker than through the stamp mills. The hopper, J, is for the purpose of more effectually carrying the rock and depositing it into the center of the pan, M, where it is crushed by the wheel. Around the whole is a platform sufficiently large for the shovelers to stand upon to feed the mill. The above dimensions are calculated for a mill of a 35-stamp capacity, to be driven by a six and eight horse-power.

The mill is now built with screens for the outer as well as the inner surface, and is also provided with agitators for driving the pulp against the screens. The mill now building at Gutenberg & Co.'s foundry, Sacramento, will be a ponderous crusher as well as grinder. The shoes and dies are of white metal, and our examination of the castings showed them to be very heavy and strong. Mr. Cooper is an energetic man and he has studied into the mill business differently than most men do. We see by the last Calaveras Chronicle that the mill for the Boston company's mine, near Buckeye, which is one of this pattern, is now on the ground. A hurdy gurdy wheel is to drive the mill.

For miners working their own mines this mill appears to be very advantageous. It is made of all appropriate sizes. The manufacturers state that they will put these mills up to any desirable capacity to suit large properties. This quartz mill makes very little noise while in operation and it grinds the ore very fine. It can be run by water, steam or horse-power. The gears on the crushing wheel now are not beveled, so that it can raise or lower a short distance without interfering with the gearing in the least. Altogether the mill appears to be pretty effective and we will not be surprised to hear of its achieving very good results on a large scale. Messrs. Cowles & Cooper, of Sacramento, are the manufacturers.

Parties interested in this class of machinery should examine the merits of this mill, for which those most acquainted with its working claim most remarkable results.



THE CALIFORNIA GIANT QUARTZ MILL.

the welt piece. Mr. Glanville thus provides a doubled welt which will not only look neat in appearance but will project slightly above the cloth and protect the stitches upon each side from the wear to which they are subjected by the friction of the lower edge of the dress of the wearer chafing over it, and at the same time the welt piece forms a stay for the seam, both welt and stay being combined in the same piece or strip of leather.

GLOVE MANUFACTURING.—This branch of home industry is a success in California for very good reasons. When the best of California dressed skins are used, customers can depend upon a better article for wear than can be obtained of any imported article. From a recent call at I. W. Lusk's "Sacramento Glove Factory," on 10th street, between J and K streets, Sacramento, we learned that ladies' and gents' driving and other gloves were made of black kid, russet, and drab, and Indian tanned buckskin. Mittens are also made for boys and girls—old and young. Singular as it may appear to Northerners, the busy season in this trade is during the warmest part of the year, from May to November. This is on account of mining, teaming, harvesting and other farm work prevailing during the summer months. To obtain a correct measurement for the glove maker, place the palm of the hand on a piece of paper, spread the fingers well apart and mark around them with a pencil. Measure around the palm of the hand and mark the circumference on the penciled figure, and you are guaranteed a fit from any such a pattern. Mrs. Lusk informed us that the above named factory (formerly owned by W. F. Ashby,) has been established over nine years. The work is done principally by ladies, and we wish the enterprise continued success.

CALIFORNIA CARRIAGE MANUFACTURING CO.—Messrs. W. L. Pritchard, George Cowles and C. Zimmerman, have established in Sacramento what is now the largest carriage factory on this coast. The building has four stories, fronting 168 feet on Eighth street and 88 on K street. Cost, \$100,000, including the lot. They have the latest improved machinery, systematically arranged for turning out good work economically. This home enterprise is worthy of future notice in our columns.

to the rancho. Mr. and Mrs. Metz, of Laramie City, were killed, and a colored woman taken prisoner. A man named Simpson was also killed. Three men were wounded—Grichan, from Missouri, mortally; Felton, from Maine, and W. Bergessir, from Virginia City, Nevada, seriously. It is feared their wounds may prove fatal. The wounded men are at Cheyenne River rancho. The place where the attack was made is about 120 miles from Fort Laramie. Altogether, those who did not go to the Black hills can congratulate themselves on being wise enough to stay at home.

THE SILVER QUESTION.—The long looked for and anxiously expected speech by Senator Jones on the silver question was made this week. The telegraph has brought us only a summary of the speech, but as it is said to fill 61 columns of an ordinary paper, it will come better by mail. Senator Jones wants a return to the double standard of gold and silver. His arguments are very comprehensive, and cover a great deal of ground. In fact, it would be impossible to criticize it at all without reading the speech entire, which we shall take pleasure in doing on its arrival by mail.

BISMUTH.—"H. H." writes us from Franktown, Nevada, describing a mineral he supposes to be bismuth, and asking us to give him some description of the occurrence, etc., of bismuth; and also, to decide whether the mineral he describes is really bismuth. If "H. H." will send us, post paid, a specimen of the mineral in question, we will determine its character without any expense to him, but are unable to give any definite opinion from the meager description received.

Dr. J. THOMAS JOHNSON will represent the Press in Virginia City and other parts of the State of Nevada on business and editorial matters. Our friends will find him a true gentleman, and we invite them to assist him in his laborious efforts for the mutual advantage of the community and our paper.

EX-ATTORNEY GENERAL BUCKNER, of Carson, has completed the sale of the Montezuma mine, in Humboldt county, to San Francisco men, for \$30,000.

Another Mechanical Miracle.

The credulity with which intelligent journalists accept as true the most extravagant and impossible statements concerning new inventions, indicate a degree of simple faith and an abiding trust in human nature which is not often found now-a-days, except among holders of Keeley motor stock. The latest "invention" of this kind is a device for producing unlimited heat by burning seven-eighths water and one-eighth of something else mixed with it. The Chicago Times thus heralds it to the world:

"Yesterday we were shown what promises to be the most wonderful invention of the age, and one which promises to revolutionize our entire domestic economy. It is nothing less than a substitute for fuel, produced at comparatively no expense, and by the application of the simplest scientific contrivance. The invention is denominated the hydro-carbon burner and gas generator. By the application of the invention, ordinary coal oil and water may be made to produce heat enough to run an engine, propel machinery, heat a cooking stove, illuminate a mansion, or perform any other result usually accomplished by means of wood or coal. By its use the most difficult mechanical problems are to be solved in the future. The burden of gas monopolies will be abolished, and the new system of generating heat from water and oil will astonish the scientist as the unschooled and undisciplined mind. The process is not complicated or mysterious. It is simply the result which overwhelms the mind with its wonderful possibilities. Prof. Kendall, the well known chemist, who has experimented with this invention, says that all the fire to do the cooking and washing for six persons seven days can be produced for 50 cents. The apparatus burns from one-fourth to seven-eighths as much water as it does any other combustible fluid, and produces a result which cannot fail to fill every one with amazement who witness its operations. For household purposes it is unexcelled. There is no dust or filth, smoke or disagreeable scent about it. Gas can be furnished from any cooking stove to illuminate a house for 50 cents per thousand feet. The light produced is clear, bright and steady, far superior in quality and illuminating properties to the ordinary gas produced from coke, which costs from \$3 to \$3.50 per 1,000 feet. The attachment can be made to any stove, range or furnace, or motive power, with entirely satisfactory results. A patent has been procured, and the inventor, a very eminent scientific gentleman, is now prepared to enter the field, and capture the public with an invention, obvious on sight, and more useful to civilized man than could be the realization of the wildest dreams created by the alleged claims of the Keeley motor, which have created so much comment and interest in the public mind. The simplicity and practicability of this apparatus can be determined on sight, and it is destined to go into general use as soon as its merits become known to the public. It has been examined by scientific men, and the principles of its foundation have been pronounced sound and in accordance with chemical science. Its discovery is more valuable to mankind than the alchemist's stone. By means of it the sufferings of the poor will be ameliorated and their sufferings assuaged. The inventor of cheap fuel may indeed be called a benefactor to his kind, and the blessings of the world will follow him. The genuineness and utility of this great and wonderful invention is destined soon to be acknowledged by the world at large, for truth is irresistible."

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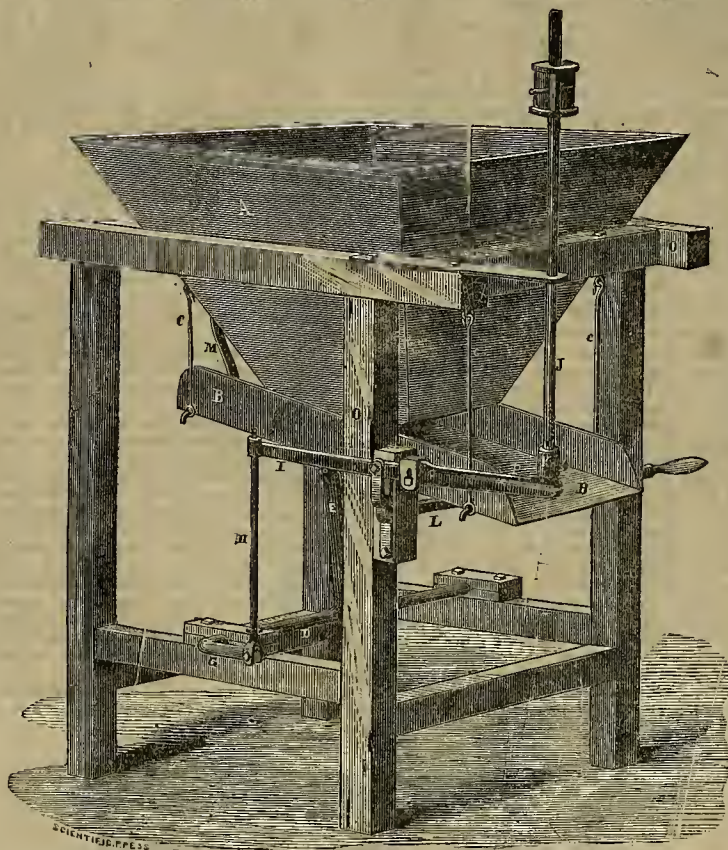
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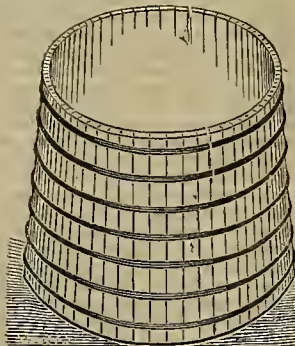
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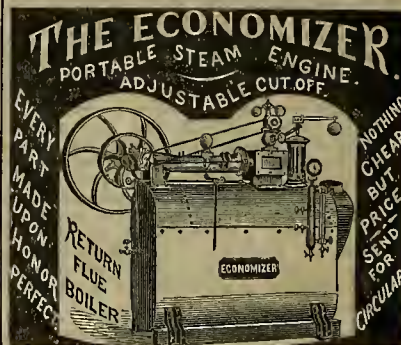
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Power is Required.

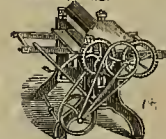
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The only Foot Power Machine without crank or dead centers, \$1,500 to \$2,000 per year made using these machines. Send for illus. of Catalogue Rockford, Winnebago county, Ill.

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Tunneling Machinery.

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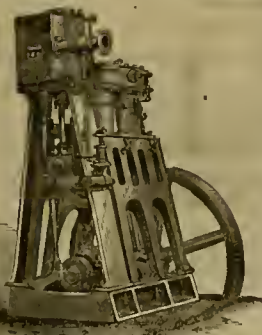
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HASKINS' PORTABLE HOISTING ENGINES, constructed especially for economical use in mining districts, with Compressed Air or Steam, adapted to all classes of underground work and made throughout on the interchangeable plan, so that all parts can be duplicated when desired. Catalogues and Estimates given on application.

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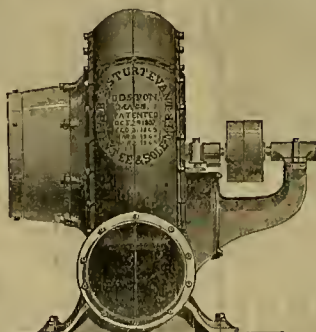
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Pumps,

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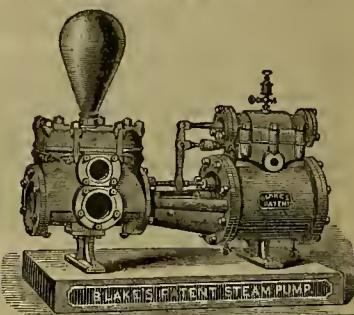
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Perin's French Band Saw
Blades,

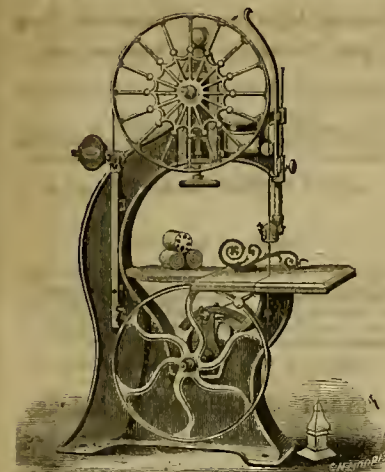
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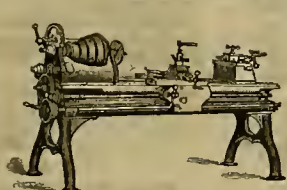
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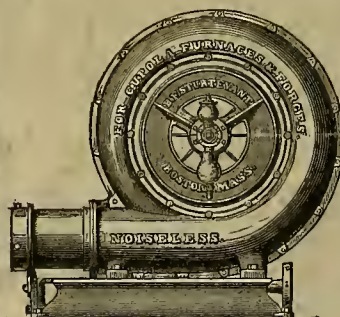
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Large Stock Always on Hand.

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Save from sixty to eighty cent.
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method.

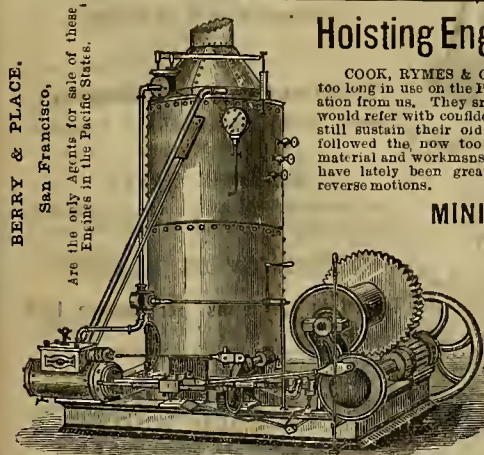


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Are the only Agents for sale of these
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COOK, RYMES & CO.'S celebrated Hoisting Engines have been
too long in use on the Pacific coast to require any special recommend-
ation from us. They are well known from Alaska to Mexico. We
would refer with confidence to any one of the hundreds in use. They
still sustain their old reputation, the manufacturers not having
followed the now too common practice of reducing the quality of
material and workmanship to compete with cheaper engines. They
have lately been greatly improved by adding large drums, and
reverse motions.

MINING HOISTING ENGINES.

(Manufactured by the same parties.)

Our new Mining Engine is built from plans
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successful MINING ENGINEERS, and the re-
sult is the most complete

Double Drum Hoisting Engine

Ever built. Their advantages will be seen
at a glance by any one familiar with the
necessities of a mine. These engines may
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oughly familiar and competent, by practical experience,
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We have just added a large amount of new machinery of
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stantly on hand a large stock of Manila Rope, all sizes;
Tarred Manila Rope; Hay Rope; Whale Line, etc., etc.

TUBBS & CO.,

611 and 613 Front street, San Francisco

(Continued from Page 278.)

Arizona.

MINE SOLD.—Arizona Miner, April 14: The mine known as the McKinnon & Oodwin, on the War Eagle ledge, Peck district, was sold on Saturday last by Rod McKinnon and John Goodwin to Wells Coe, of San Francisco, for \$10,000 in gold coin. We understand it is Mr. Coe's intention to sink 200 feet on the mine immediately, after which he will decide what to do next. This mine consists of a thousand feet along the War Eagle, and has been worked for two or three years by McKinnon and Oodwin as a gold mine by the process, and has always yielded good pay. So that now with the proceeds of this sale added to their earnings in the past gives them quite a handsome stake. It is believed that the War Eagle is an extension of one of the Peck series, and that at a depth sufficient to bring them on a level with the Peck they will find it to be a silver mine of great richness. The gold mines of all this region are prone to run into silver when the water level is reached, though this may be an exception to the rule, as in other cases the silver ores have been sulphureted in character, whereas the Peck and the Prince contain chiefly silver and carbonates. We had a talk with McKinnon on Sunday morning, and he informed us that he and Oodwin had other ground on the same ledge which they propose to develop, and which may prove as good as that they have sold.

THE MIDAS MINE.—H. T. Scott and A. Welsh discovered the Midas mine, on the east side of the Hasayampa, some seven miles below the old Sterling mill, and have recently started to assay the ore. They were in town Sunday and Monday with their first clean-up, some \$500 in very fine gold. The ledge is 12 feet wide where they are at work, and 30 in other places.

THE BLOELOW & THOMPSON TUNNEL.—On the 10th of January last Col. H. A. Bigelow and Oeo. S. Thompson started in on a contract to run a tunnel 240 feet on the Peck mine, working one shift of three men, and were to have all the ore they took out. They started on a small seam and took out a small quantity of high grade ore, which gave out, and they ran some 40 feet without finding anything until a week ago Saturday, when it came in again, and they are now running on the pay streak, which is widening as they approach the shaft.

Colorado.

MINING NOTES.—Colorado Springs Gazette, April 16: Owing to the unsettled weather and the snow on the mountains no prospecting and comparatively little work has been done in the way of developing the lodes before located in this vicinity the past week. The little that has been done, however, has gone very far towards settling the question favorably as to our having not only paying ores, but very rich ores of various kinds and in great quantities.

Much work is awaiting the result of the eight tons sent to Black Hawk from the Ute Pass mine, at Manitou, some weeks ago. This was treated on Wednesday last, but the result has not been received at this writing.

Box little work has yet been done on any of the lodes of the golden belt of Chama and Dog creeks, for reason of the snow. The little done, however, has been sufficient to establish their value in the minds of all who have seen them. The samples of ore shown us from the latest workings are certainly very fine, and would indicate strong veins. Rough tests of the quantity of silver contained in the galena, and in the shale lying between it and the hanging wall, have been made, and both show a considerable quantity of this metal. No trial has yet been had for gold, but an average of the pay streaks will be taken for assay in a few days. The belt is composed of a number of parallel lodes, with others crossing at nearly right angles.

A vein of honey-combed quartz has been found on the mountain west of Monument park 18 inches in width, which assayed by Prof. Schurmer, of the Denver school, showed a fine quantity of this metal. We do not know whether this is a fissure or contact vein, but from the appearance of the ore judge it to be the latter.

Several miners from Sunshine and vicinity are now at work here, and none are so confident of the value of the lodes of this region as they. They all agree that depth will reveal as rich tellurides as are found in Boulder county, and in very much larger seams. This must be determined by reaching the necessary depth on at least one location, before we can know that we have the same class of ores.

Idaho.

ATLANTA MINES.—Idaho Statesman, April 20: The mining developments of the past winter are of a more satisfactory and positive character than the labor of all the past years combined. The developments in the Monarch and Buffalo companies' works have established the fact that the Atlanta is a vein of the first magnitude, and inexhaustible in wealth. The recent strike in the lower tunnel of the Buffalo company, at a depth of 125 feet on the vein, has inspired a general feeling of confidence in the community. They struck the north wall of the vein proper some 400 feet from the surface, after driving thirty feet across the vein a streak of rich ore, some four feet wide, rewarded their efforts. In a few feet it increased to seven feet in width. I am not informed as to the value of the ore per ton, but am told that two feet and a half in width of the vein is recovered for shipping, which is a sufficient guarantee of its richness. Aside from the Buffalo and Monarch companies there are other companies running long tunnels to tap the Atlanta. On the Yuba side Messrs. Julian F. Hill and Wm. Abbott, of Idaho City, have run 170 feet of tunnel, which should strike the vein in 50 feet farther at a depth of over 100 feet. They have suspended work, however, to attend to placer mining in the Basin. For the information of those who think of coming here, I will say "grub" is scarce, consequently there will not be much done until the road is open.

Washington Territory.

THE MICA MINES.—Last Saturday Messrs. A. H. Simmons and J. D. Cook returned from a four months' prospecting and mining tour in the Coeur d'Alene mountains. During the greater part of their absence they were engaged in developing a ledge of mica discovered by Mr. Simmons several years ago. The mines are located on a spur of the Coeur d'Alene mountains, about seven or eight miles west of Lake Coeur d'Alene, in Stevens county. The altitude is about 4,000 feet. The vein at present being worked is about 10 feet wide; course from southeast to northwest; dip, about 60 deg. The foot wall is a hard semi-crystallized quartzite. The gangue is a micaceous schist, consisting of laminated mica and mica, the latter predominating. While the mineral assumes nearly all imaginable shapes, the favorite form, and in which the best material is generally found, is that of an irregular triangle, in which shape it is found in the schist and often entirely encased in the hard quartz, in pieces weighing 60 pounds and more. As to the extent and capacity of the mine at present we can give but little information, but it is believed that its resources are comparatively unlimited.

MAMMOTH POLISHED GRANITE COLUMNS.—The Union iron works, of Root, Nielson & Co., Sacramento, have recently manufactured to order the head blocks for an immense polishing lathe for Griffith, of the Penryn quarries. They are to be used in polishing the granite columns for the imposing front of the San Francisco Stock Exchange building, now being erected on Pine street.

PATENTS & INVENTIONS.

A Weekly List of U. S. Patents Issued to Pacific Coast Inventors.

FROM OFFICIAL REPORTS FOR THE MINING AND SOLE TITIO PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.]

By Special Dispatch, Dated Washington, D. O., April 25th, 1876.

FOR WEEK ENDING APRIL 11th, 1876.*

PASSENGER REGISTERS.—Charles A. Washburn, Oakland, Cal.
FRUIT DRYERS.—William Aram, San Jose, Cal.
RUBY PIN INSERTS FOR WATCHES.—Carl H. E. Becker, Ocoville, Cal.
MOVABLE LOCKING TYPES.—William H. Bell, S. F., Cal.
CHIMNEYS.—Jeremiah Browell, S. F., Cal.
WHEEL PLOWS.—Edmund C. Brown, Antelope, Cal.
MACHINE FOR PACKING FRUIT AND OTHER ARTICLES.—George W. Deitzler, S. F., Cal.
SASH HOLDBERS AND FASTENERS.—William A. Hawthorne, Carson City, Nev.
COUPLINGS FOR TRAIN TELEGRAPH.—Andrew Ryder, Oakland, Cal.
COAL SCREEN AND SHUTES.—Byron La Count Satterfield, Charles L. Chrisman and James McKinley, S. F., Cal.
WATER WHEELS.—Moses M. Staples, S. F., Cal.

*The patents are not ready for delivery by the Patent Office until some 14 days after the date of issue.

NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

METALS.

[WHOLESALE.]

WEDNESDAY M., April 26, 1876.

American Pig Iron, 3 ton 38 00 @ 36 00
 Scotch Pig Iron, 3 ton 35 00 @ 37 00
 White Pig, 3 ton 35 00 @ 37 00
 Oregon Pig, 3 ton 40 00 @ 40 00
 Refined Bar, good assortment, 3 ton 34 00 @ 34 00
 Refined Bar, good assortment, 3 ton 34 00 @ 34 00
 Boiler, No. 1 to 4 54 00 @ 54 00
 Plate, No. 10 to 14 24 00 @ 24 00
 Sheet, No. 16 to 20 24 00 @ 24 00
 Sheet, No. 22 to 24 24 00 @ 24 00
 Sheet, No. 26 to 28 24 00 @ 24 00
 Horse Shoes, per keg 6 50 @ 8 00
 Nail Rod 10 00 @ 10 00
 Norway Iron 9 00 @ 9 00
 Rolled Iron 9 00 @ 9 00
 Other Irons for Blacksmiths, Miners, etc. 44 00 @ 44 00

COPPER.—
 Copper Tin, 3 ton 35 00 @ 35 00
 O'Neil's Pat. 37 00 @ 37 00
 Sheathing, 3 ton 24 00 @ 24 00
 Sheathing, 3 ton 24 00 @ 24 00
 Sheathing, Old Yellow 24 00 @ 24 00
 Composition Nails 24 00 @ 24 00
 Composition Nails 24 00 @ 24 00
 Anderson & Woods' 24 00 @ 24 00
 Drill 18 00 @ 18 00
 Flat Bar 18 00 @ 18 00
 Flat Steel 18 00 @ 18 00

TIN PLATE.—
 10x14 Charcoal 10 50 @ 11 00
 10x14 X Charcoal 12 50 @ 13 00
 Rood's Plate 26 00 @ 26 00
 Banca Tin 26 00 @ 26 00
 Australian 18 00 @ 20 00
 Zino, By the Case 11 00 @ 11 00
 do 7x3 ft, No 11 to 14 11 00 @ 11 00
 do 8x4 ft, No 8 to 10 11 00 @ 11 00
 do 8x4 ft, No 11 to 10 11 00 @ 11 00
 Nails Assorted 3 00 @ 3 00
 Quicksilver, per lb 72 00 @ 72 00

LEATHER.

[WHOLESALE.]

WEDNESDAY M., April 26, 1876.

City Tanned Leather, 3 ton 22 00 @ 22 00
 Santa Cruz Leather, 3 ton 22 00 @ 22 00
 Country Leather, 3 ton 22 00 @ 22 00
 Stocking Leather, 3 ton 22 00 @ 22 00
 Jodot, 8 Kil, per doz 50 00 @ 50 00
 Jodot, 11 to 13 Kil, per doz 50 00 @ 50 00
 Jodot, 14 to 16 Kil, per doz 50 00 @ 50 00
 Jodot, second choice, 11 to 13 Kil, per doz 50 00 @ 50 00
 Cornelian, 12 to 16 Kil 50 00 @ 50 00
 Cornelian Females, 12 to 13 50 00 @ 50 00
 Cornelian Females, 14 to 15 Kil 50 00 @ 50 00
 Simon Ulmo Females, 12 to 13 Kil 50 00 @ 50 00
 Simon Ulmo Females, 14 to 15 Kil 50 00 @ 50 00
 Simon, 18 Kil, 3 doz 50 00 @ 50 00
 Simon, 20 Kil, 3 doz 50 00 @ 50 00
 Simon, 24 Kil, 3 doz 50 00 @ 50 00
 Robert Calf, 7 and 9 Kil 50 00 @ 50 00
 California Kid, 3 doz 50 00 @ 50 00
 French Sheep, all colors, 3 doz 50 00 @ 50 00
 Eastern Calf for Backs, 3 doz 50 00 @ 50 00
 Sheep Roans for Popping, all colors, 3 doz 50 00 @ 50 00
 Sheep Roans for Lining, 3 doz 50 00 @ 50 00
 California Russet Sheep Linings 50 00 @ 50 00
 Best Jodot Calf Boot Legs, 3 pair 50 00 @ 50 00
 French Calf Boot Legs, 3 pair 50 00 @ 50 00
 French Calf Boot Legs, 3 pair 50 00 @ 50 00
 Harness Leather, 3 doz 50 00 @ 50 00
 Fair Bridle Leather, 3 doz 50 00 @ 50 00
 Skirting Leather, 3 doz 50 00 @ 50 00
 Wolf Leather, 3 doz 50 00 @ 50 00
 Wax Side Leather, 3 foot 50 00 @ 50 00

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by CHARLES SUTRO & Co.]

LEGAL TENDERS IN S. F., 11 A. M., 89 3/4 to 90 1/2. Silver, 3 1/2 per cent discount.
 GOLD IN N. Y. 113.
 GOLD BARS, 900 to 910. SILVER BARS, 12 and 20 per cent discount.
 EXCHANGE ON N. Y., 50-100 per cent premium for gold; on London bankers, 49; Commercial, 48 1/2; Paris, 47 1/2; France per dollar; Mexican dollars, ten per cent discount.
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 QUICKSILVER IN S. F., by the case, per lb, 72 00 @ 75 00.

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A Mining and Civil Engineer of long experience, well acquainted with the superintendence of mines and mills, the projecting and construction of hydraulic works, machinery, etc., is open for re-engagement. Apply to Messrs. Dewey & Co., of the MINING & SCIENTIFIC PRESS, 224 Sansome street, San Francisco, for reference, or to J. , Postoffice Box 633, Oakland, Cal.

GENERAL MERCHANDISE.

WHOLESALE.]

WEDNESDAY M., April 26, 1876.

BAGS.—
 Fog Stand Wht. 12 @ 12 1/2
 Nerile & Co's. 12 @ 12 1/2
 Hand Sewed. 12 @ 12 1/2
 24x36. 12 @ 12 1/2
 24x40. 12 @ 12 1/2
 Mactine. 12 @ 12 1/2
 " 23x40. 12 @ 12 1/2
 " 22x40. 12 @ 12 1/2
 " 22x36. 12 @ 12 1/2
 Flour Sacks. 12 @ 12 1/2
 " 24x36. 12 @ 12 1/2
 " 24x40. 12 @ 12 1/2
 Hessian 1/2 in. 12 @ 12 1/2
 do 45 in. 12 @ 12 1/2
 do 40 in. 12 @ 12 1/2
 Wool Sacks. 12 @ 12 1/2
 Stand. 12 @ 12 1/2
 single seem do. 12 @ 12 1/2
 Bean Bags. 12 @ 12 1/2

CANNED GOODS.—
 in 2 1/2 lb cans. 2 7/8 @ 3 60
 do 2 lb cans. 3 7/8 @ 4 25
 Jams & Jellies 4 25 @ 5 00
 Cumberland. 15 @ 18 1/2
 Sardines. 60 @ 1 90
 do 1/2 boxes. 3 00 @ 3 00

COAL-Jobbing.—
 Australian. 3 ton 50 00 @ 50 00
 Cape Bay. 8 ton 8 00 @ 8 00
 Bellingham Bay. 8 ton 8 00 @ 8 00
 Seattle. 9 25 @ 10 50
 Cumberland. 15 @ 18 1/2
 Mt. Diablo. 6 25 @ 6 25
 Lehigh. 10 00 @ 10 00
 Liverpool. 10 00 @ 10 00
 West. 10 00 @ 10 00
 Scotch. 9 00 @ 11 00
 Scranton. 13 00 @ 16 00
 Vancouver's Is. 50 @ 12 00
 Charcoal. 15 @ 18 1/2
 Coke. 3 bbl. 10 @ 60

COFFEE.—
 Sandwich Island. 21 1/2 @ 21 1/2
 Costa Rica per lb. 22 1/2 @ 22 1/2
 Guatemala. 22 1/2 @ 22 1/2
 Java. 30 @ 30
 Manila. 21 1/2 @ 21 1/2
 Ground in oe. 27 @ 27
 Chicory. 27 @ 27

FISH.—
 Sae. Dry Cod. new 4 @ 4 1/2
 cases. 8 1/2 @ 10
 do Boston. 8 1/2 @ 10
 Eastern Cod. 7 1/2 @ 8
 Salmon in hble. 7 00 @ 8 00
 do 1/2 bbls. 7 00 @ 8 00
 do 2 1/2 cans. 2 25 @ 2 40
 do 1 lb cans. 1 25 @ 1 60
 do Col. R. 4 50 @ 5 00
 Pick. Oat. 1/2 bbl. 10 @ 13 00
 " Extra. 12 @ 12 00
 " 2 20 @ 2 20
 " Ex. mess. 14 00 @ 14 50
 " Ex. mess. 14 00 @ 14 50
 Pick'd Herr. 3 00 @ 3 50
 Bos. Salted. 40 @ 50

LIME, ETC.—
 Lime, 8 to Cruz. 2 00 @ 2 25
 do 8 to Cruz. 2 00 @ 2 25
 do Portland. 4 75 @ 5 00
 Plaster, Golden. 3 00 @ 3 25
 do 3 00 @ 3 25
 Land Plaster. 10 00 @ 12 50
 ton. 10 00 @ 12 50

MISCELLANEOUS.—
 Pul. 7 1/2 @ 7 1/2

NAILS.—
 Assorted size, keg 3 75 @ 4 00

OILS.—
 Pacific Gln. No. 1. 1 00 @ 90
 Neet Ete No. 1. 1 00 @ 90
 Castor Oil, No. 1. 1 15 @ 15
 Kerosene. 1 15 @ 15
 Occoano. 52 @ 55
 Olive Plagniol. 5 50 @ 5 50
 do Fossil. 4 75 @ 5 00
 do 9 00 @ 9 00
 Linsed. raw. 7 00 @ 7 00
 do boiled. 7 00 @ 7 00
 China nut in os. 65 @ 67 1/2
 Spermin. grade. 1 00 @ 1 15
 do bleached. 1 00 @ 1 15
 Coast Whales. 47 1/2 @ 50
 Polar, refined. 50 @ 50
 Lard. 50 @ 50
 Oleophene. 25 @ 27
 Devoe's Bril. 25 @ 27
 Rong Island. 25 @ 27
 Europa. 26 @ 27

PAINTS.—
 Devoe's Petro'm 25 @ 27 1/2
 Barrel kerosene 23 @ 25
 Olive. 23 @ 25
 Downer Kerosene 27 1/2 @ 27 1/2
 Elaine. 27 1/2 @ 27 1/2
 Gas Light Oil. 23 @ 25

PAINTS.—
 Pure White Lead 9 1/2 @ 10 1/2
 Whiting. 4 @ 4 1/2
 Ch Yellow. 4 @ 4 1/2
 Ch Yellow. 4 @ 4 1/2
 Parie White. 1 1/2 @ 1 1/2
 Ochre. 1 1/2 @ 1 1/2
 Venetian Red. 1 1/2 @ 1 1/2
 Red Lead. 10 @ 11
 Litharge. 10 @ 11
 Eng. Vermilion. 10 @ 11
 Averi Chemical. 21 @ 25

PAINTS.—
 Point, per gal. 2 00 @ 2 40
 White & gals. 2 00 @ 2 40
 Green. Blue & 42 @ 43 50
 Ch Yellow. 3 00 @ 3 50
 Light Red. 3 00 @ 3 50
 Metallic Roof. 30 @ 60 00

RICE.—
 China No. 1. 10 00 @ 10 00
 Hawaiian. 7 1/2 @ 7 3/4
 Carolina. 10 @ 10

RICE.—
 Cal. Bay. per ton 10 00 @ 14 00
 do Common. 5 00 @ 7 00
 Oarmen Island. 12 00 @ 15 00
 Liverpool. 12 00 @ 15 00

CANDLES.—
 Grant's. 16 1/2 @ 17
 Mitchell's. 20 @ 22

SPICES.—
 Cloves. 25 @ 27 1/2
 Oases. 23 1/2 @ 26 1/2
 Oil. 23 @ 26 1/2
 Nutmeg. 35 @ 37 1/2
 White Pepper. 14 1/2 @ 15 1/2
 Pimento. 16 @ 17 1/2
 G'nd Allsp. prdz. 10 @ 12 1/2
 do Cassia. 10 @ 12 1/2
 do Golden C. 10 @ 12 1/2
 do Mustard. 10 @ 12 1/2
 do Ginger. 10 @ 12 1/2
 do Pepper. 10 @ 12 1/2
 do Mustard. 10 @ 12 1/2

SUGAR, ETC.—
 Cal. Cane per lb. 12 @ 12
 do 12 @ 12
 Powdered. 12 @ 12 1/2
 Fine crushed. 12 @ 12 1/2
 Granulated. 11 1/2 @ 11 1/2
 Golden C. 10 @ 12 1/2
 Cal. Syrup in keg. 10 @ 11
 Hawaiian Molasses. 25 @ 27 1/2

TEA.—
 Oolong, Canton. 19 @ 25
 do Amoy. 28 @ 30
 do Formosa. 40 @ 40
 Imperial, Canton. 25 @ 40
 do Punguey. 45 @ 80
 do Moyne. 60 @ 100
 Gunpowder, Canton. 75 @ 90
 do Punguey. 60 @ 90
 do Moyne. 65 @ 125
 Yng Hy, Canton. 28 @ 40
 do Moyne. 40 @ 70
 do Moyne. 65 @ 87
 Japan, 3 ohests. 30 @ 75
 hks. 4 1/2 and 5 lbs. 45 @ 67
 Japan, 3 bbs. 45 @ 90
 do 1/2 bbl. 35 @ 55
 do 2 1/2 bbl. 30 @ 55

TOBACCO-Jobbing.—
 Pure. 50 @ 65
 Bright Navy. 50 @ 65
 Dark. 50 @ 55
 Pages Tin Foil. 75 @ 75
 Gregory. 75 @ 75
 Dwa. 1/2 Twist. 65 @ 75
 night Pressed. 70 @ 80
 Hard. 50 @ 60
 Conn. Wrap. 20 @ 45
 Penn. Wrapper. 20 @ 45
 Ohio. 15 @ 20
 Ing. buo's. 75 @ 75
 Fire's Smoke. 60 @ 60
 Fina's Smoke. 50 @ 50
 Fine out ohew. 50 @ 50
 ing. buo's. 75 @ 75
 Lard. 50 @ 50
 Cal Smoking. 37 @ 100
TURPETINE.—
 Eastern. 51 1/2 @ 55

OAKLAND, Saturday, May 13th, 1876

WOODWARD & TAGGART,

Real Estate Auctioneers.

R. A. COBB, AUCTIONEER, WILL SELL AT PUBLIC AUCTION, On Saturday, May 13th, 1876, at Salesroom, 460 and 462 Eighth Street, Oakland.

42 Choice Residence Lots, THE PROPERTY OF CHRISTIAN BAEOE.

This property is situated in a portion of the city that is improving as rapidly as any part of the city; is but a short distance from schools and churches; but four blocks from the Berkeley railroad, which is now being built and will be completed within 30 days. A station is to be built at the foot of Fourteenth street, which will bring this property within 30 minutes of San Francisco. There is not to be found within the city limits more desirable residence sites than this property presents. A horse railroad will soon be built in front of this property, which will bring it within five minutes' ride of Broadway station. Terms, one-fifth cash, one-fifth in one year, one-fifth in two years, one-fifth in three years, one-fifth in four years. Interest on deferred payment at the rate of 10 per cent. per annum. For further particulars, apply to

WOODWARD & TAGGART, 460 and 462 Eighth Street, Oakland.

MAURICE DORE & CO., 326 Pine Street, San Francisco.

Metallurgy and Ores.

JOHN TAYLOR & CO.,

IMPORTERS OF AND DEALERS IN

ASSAYERS' MATERIALS

Chemical Apparatus and Chemicals, Druggists Glassware and Sundries, etc.

512 and 518 Washington street, SAN FRANCISCO

We would call the special attention of Assayers Chemists, Mining Companies, Milling Companies, Prospectors, etc., to our large and well adapted stock

ASSAYERS' MATERIALS

—AND—

Chemical Apparatus,

Having been engaged in furnishing these supplies since the first discovery of mines on the Pacific Coast.

Our Old and Silver Tables, showing the value per ounce Troy at different degrees of fineness, and valuable tables for computation of assays in Ounces Grammes, will be sent free upon application.

725-17

JOHN TAYLOR & CO.

Nevada Metallurgical Works,

21 First street.....San Francisco.

Ores worked by any process.

Ores sampled.

Assaying in all its branches.

Analysis of Ores, Minerals, Waters, etc.

Plans furnished for the most suitable process for working Ores.

Special attention paid to the Mining and Metallurgy of Quicksilver.

E. HUNN,

C. A. LUCKHARDT,

Mining Engineers and Metallurgists.

RODGERS, MEYER & CO.,

COMMISSION MERCHANTS,

ADVANCES MADE

On all kinds of Ores, and particular attention

PAID TO

CONSIGNMENTS OF GOODS.

416-3m

Instructions in Assaying,

Chemical Analysis, Determination of Minerals, and use of the Blow-pipe.

HENRY G. HANKS

Will receive a few pupils at his new laboratory, 817 Montgomery street, up-stairs. TERMS MODERATE

QUICKSILVER FLASKS,

Tested to 1,000 lbs. per Square Inch,

For Sale in Lots to Suit,

DUNHAM, CARRIGAN & CO.

LEOPOLD KUH,

(Formerly of the U. S. Branch Mint, S. F.)

Assayer and Metallurgical

CHEMIST,

No. 611 Commercial Street,

(Opposite the U. S. Branch Mint.

SAN FRANCISCO CAL.

721-3m

SEWING MACHINES.—We have a first-class machine we wish to dispose of on favorable terms. Apply at this office.

Banking.

The Merchants' Exchange Bank OF SAN FRANCISCO.

Capital, Five Million Dollars.

A. HAYWARD, President.
C. W. KELLOGG, Vice-President.
H. F. HASTINGS, Manager.
R. N. VAN BRUNT, Cashier.

BANKING HOUSE,
No. 423 California street San Francisco.

KOUNTZ BROTHERS, BANKERS, 12 WALL STREET, NEW YORK.

Allow interest at the rate of Four per cent. upon
daily balances of Gold and Currency.
Receive consignments of Gold, Silver and Lead
Bullion, and make Cash advances thereon.
Invite Correspondence from Bankers, Mining
Companies, Merchants and Smelting Works.

French Savings and Loan Society,

411 Bush street, above Kearny..... SAN FRANCISCO
47274 G. MAHE, Director.

Business Directory.

J. H. PAGE, J. S. WILSON, Wm. E. HALE,
Late John Taylor & Co. Mem. S. F. Board
HALE, PAGE & WILSON,
Commission Stock Brokers, 429 California Street, S. F.
Money Loaned on Leading Stocks.

OILES H. GRAY, JAMES M. HAVEN.
GRAY & HAVEN,
ATTORNEYS AND COUNSELORS AT LAW
in Building of Pacific Insurance Co., N. E. corner Cal-
ifornia and Leidesdorff streets,
SAN FRANCISCO.

WM. BARTLING, HENRY KIMBALL.
BARTLING & KIMBALL,
BOOK BINDERS,
Paper Rulers and Blank Book Manufacturers.
505 Clay street, (southwest cor. Sansome),
2-3m SAN FRANCISCO

WIRE ROPE

For Mining, Shipping, and General Pur-
poses.

All kinds and sizes on hand, or made to order; guar-
anteed of unsurpassed quality, and manufactured of
any length. FLAT ROPES, ROUND ROPES and
TAPER ROPES, OF IRON OR STEEL.

Patent Endless Wire Ropeway

(WIRE TRAMWAY)

FOR THE RAPID AND ECONOMICAL TRANSPOR-
TATION OF ORES AND OTHER MATE-
RIAL OVER MOUNTAINOUS
AND DIFFICULT
ROADS.

This system has been in use for over three years
and given thorough satisfaction.

PATENT GRIP PULLEY,

For transmission of power by means of wire ropes

WIRE.

Fencing Wire and Staples,

BALING WIRE,

SPRING WIRE,

GALVANIZED WIRE,

B OOM WIRE,

STEEL WIRE,

COPPER WIRE,

BRASS WIRE

And Wire of all kinds, on hand or made to order.

SOLE AGENT FOR

Richard Johnson and Nephews' Cele-
brated Telegraph Wire.

Full stock on hand in bond, or duly paid.

Wire Cloth and Wire Netting,

Full Assortment on hand for all Purposes.

—AND—

All Kinds of Goods in the Wire Line.

Send for Circulars, etc., to

A. S. HALLIDIE,

118 and 115 Pine Street, S. F.

NEW ASSAY OFFICE.

Thomas Price (formerly of the San Francisco
Assaying and Refining Works), having fitted
up the old Pacific Mail building, No. 524 Sacra-
mento street, corner of Leidesdorff, as an
Assay Office and Chemical Laboratory, is now
prepared to make assays of the precious and
useful metals and their ores, as well as com-
plete or partial analyses of all minerals, salts,
waters or other substances that may be desired.

His office will be opened for business on
Monday, May 1st, and he hopes that his long
residence and experience in his profession will
entitle him to a reasonable portion of the busi-
ness of his friends and the public generally.

THE O'HARRA

CHLORIDIZING FURNACE.

Guaranteed to Chloridize from 85 to 95 per cent. of
any gold or silver ores that are not more profitable for
smelting. Will also desulphurize ores and put them in
proper shape for working in cupola furnace.

Cost of Roasting and Chloridizing by this
Process:

Two cords of wood at \$6.....\$12.00
Two firemen at \$4..... 8.00
1500 lbs of salt at 15c..... 22.50
Wear of shoes and power..... 1.50

Cost for 15 tons.....\$44.00
Cost for one ton.....2.93 1/2

In a furnace of three or four times this capacity the
cost is decreased by 20 per cent.

The furnace is now working successfully at the Poe
Consolidated Co.'s mines, in the Peavine District. For
further information, apply to

D. J. O'HARRA,
Reno, Nevada.

ASBESTOS COATING

FOR

STEAM BOILERS, PIPES, ETC.

U. S. & FOREIGN

Salamander Felting Company.



PACIFIC BRANCH,

SEWARD COLE, - Manager,
OFFICE, 317 California street, S. F.

FACTORY, Berry street, bet. 4th and 5th, S. F.
NEVADA AGENCY, 38 North C street, Virginia.

INDESTRUCTIBLE NON-CONDUCTOR OF HEAT
Saves 15 to 30 per cent. in Fuel.

REFERENCES: U. S. Government buildings and principal
manufacturing establishments in the East and on
the Pacific slope; principal mines and mills in Nevada.

Agents for H. W. JOHNS' Patent
Asbestos Roofing and Paints

FIRE AND WEATHER PROOF;

Asbestos Steam Packing,

Made from Pure Long Fiber Asbestos,

INDESTRUCTIBLE SELF-LUBRICATING!

Keefe's Boiler Compound,

Prevents the formation of Scale in Boilers and removes
the same, without injuring the iron or
causing the water to foam.

7 Circulars, Descriptive Pamphlets, etc., Sent Free.

CONCENTRATION OF ORES (of all kinds), including
the Chlorination Process for Gold-bearing Sulphurets,
Arsenurets, and Ores and Silver Ores generally, with
120 Lithographic Diagrams, 1867. The most complete
treatise. Published at this office. Price \$5, post-paid.

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BRASS and BELL FOUNDRY SAN FRANCISCO.

MANUFACTURER AND IMPORTER OF
Church and Steamboat BELLS and GONGS,
BRASS CASTINGS of all kinds,
WATER GATES, GAS GATES,
FIRE HYDRANTS,
DOCK HYDRANTS,
GARDEN HYDRANTS.

A General Assortment of Engineers' Finding.
Hooker's Patent
Celebrated



STEAM PUMP

The Best and Most
Durable in use. Also,
a variety of other

PUMPS

For Mining and Farming
Purposes.

ROOTS' BLAST BLOWERS,
For Ventilating Mines and for Smelting Works.

HYDRAULIC PIPES AND NOZZLES,
For Mining Purposes.

Garratt's Improved Journal Metal.

IRON PIPE AND MALLEABLE IRON FITTINGS.

ALL KINDS OF
WORK AND COMPOSITION NAILS,
16-17 AT LOWEST RATES.

N. W. SPAULDING'S



PATENT DETACHABLE TOOTH SAWS.

Manufactory, 17 & 19 Fremont St., S. F.

IRON PIPE.

Having been appointed Agents for
the Washington Pipe Works, we are
prepared to ship from store, Pipe and
Fittings at the lowest market prices.

BERRY & PLACE, San Francisco.

TREADWELL'S OLD STAND.

Mining and Other Companies.

Persons interested in incorporated shares
will do well to recommend the publication
of the official notices of their companies
in this paper as the cheapest appropriate
medium for the same.

California Acclimatizing Society—Loca-
tion of principal place of business, San Francisco, Cal.
Notice is hereby given, that at a meeting of the Board of
Directors, held on the seventh day of April, 1876, an assess-
ment (No. 7) of fifty (50) cents per share was levied upon
the capital stock of the corporation, payable immediately,
in United States gold coin, to the Secretary, at the office
of the company, room 37, Nevada block, No. 309 Montgom-
ery street, San Francisco, Cal.
Any stock upon which this assessment shall remain unpaid
on the seventeenth day of May, 1876, will be delinquent,
and advertised for sale at public auction, and unless pay-
ment is made before, will be sold on Wednesday, the
seventh day of June, 1876, to pay the delinquent assess-
ment, together with costs of advertising and expenses of
sale. By order of the Board of Directors,
W. TRAYLOR, Secretary, pro tem.
Office, room 37, Nevada block, No. 309 Montgomery street,
San Francisco, Cal.

The California Watch Company—Loca-
tion of principal place of business, No. 120 Sutter
street, San Francisco, Cal.

Notice.—There are delinquent upon the following
described stock, on account of assessment levied on
the eighth day of March, 1876, the several amounts set
opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Am't.
M Oodley, trustee.....	1	3,000	\$15,000 00
A Rammelsberg, trustee..	2	200	1,000 00
A Rammelsberg, trustee..	3	100	500 00
T M Antieil.....	4	10	50 00
A Rammelsberg, trustee..	6	1,130	5,650 00
Paul Cornell.....	13	10	50 00

And in accordance with law, and an order of the
Board of Directors made on the eighth day of March,
1876, so many shares of each parcel of such stock as
may be necessary, will be sold at public auction at the
office of the company, on the first day of May, 1876,
at the hour of twelve o'clock, m., of said day, to pay
said delinquent assessment thereon, together with costs
of advertising and expenses of sale.

H. T. GRAVES, Secretary.
Office, No. 120 Sutter street, room 10, San Francisco,
Cal.

POSTPONEMENT.—By order of the Board of Direc-
tors of the California Watch Company, the above sale
is hereby postponed until Monday, the eighth day of
May, 1876, at the same hour and place as above set
forth.
H. T. GRAVES, Secretary.
San Francisco, April 26th, 1876.

Eureka Stone Manufacturing Company—
Location of works, 535 Brannan street. Office for
business, 77 and 78 Montgomery Block Building, San
Francisco, Cal.

Notice.—There are delinquent upon the following
described stock, on account of assessment (No. 4),
levied on the 18th day of March, 1876, the several
amounts set opposite the names of the respective share-
holders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Portola, P.....	263	150	\$15 00
Portola, P.....	264	100	10 00
Portola, P.....	265	100	10 00
Portola, P.....	266	100	10 00
Portola, P.....	307	1550	155 00
Portola, P.....	310	500	50 00
Hood, William.....	258	1000	100 00
Hood, William.....	306	1000	100 00
Hood, William.....	311	500	50 00

And in accordance with law, and an order of the
Board of Directors, made on the 15th day of March,
1876, so many shares of each parcel of such stock as
may be necessary will be sold at public auction, at the
office of the company, Nos. 77 and 78 Montgomery Block
Building, San Francisco, Cal., on Monday, the eighth
day of May, at the hour of 12 m., to pay said delinquent
assessment thereon, together with costs of advertising
and expenses of sale.

P. D. MOWELL, Secretary.
Office, Nos. 77 and 78 Montgomery Block Building,
San Francisco, Cal.

Klamath Quartz Mining Company—Lo-
cation of principal place of business, San Fran-
cisco, Cal. Location of works, Liberty township,
Shelby county, Cal.

Notice.—There are delinquent upon the following
described stock, on account of assessment levied on the
second day of March, 1876, the several amounts set
opposite the names of the respective shareholders, as
follows:

Names.	No. Certificate.	No. Shares.	Amount.
E A Richardson, trustee....	44	500	\$1500 00

And in accordance with law, and an order of the
Board of Directors, made on the second day of March,
1876, so many shares of each parcel of said stock as
may be necessary, will be sold at public auction, at the
office of the company, room 8, No. 315 California
street, San Francisco, Cal., on Tuesday, the second day
of May, 1876, at the hour of one o'clock, p. m., of said
day, to pay said delinquent assessments thereon, to-
gether with costs of advertising and expenses of the
sale.

J. F. NESMITH, Secretary.
Office, room 8, 315 California street, San Francisco,
Cal.

Lady Franklin Gold and Silver Mining
Company. Principal place of business, City and County
of San Francisco, State of California. Location of
works, Silver Mountain Mining District, Alpine County,
California.

Notice is hereby given, that at a meeting of the Board of
Directors held on the third day of April, 1876, an assess-
ment of fifty (50) cents per share was levied upon the
capital stock of the corporation, payable immediately, in
United States gold coin, to the Secretary, at his office,
507 Montgomery street, San Francisco, Cal.

Any stock upon which this assessment shall remain un-
paid on the 15th day of May, 1876, will be delinquent,
and advertised for sale at public auction, and unless pay-
ment is made before, will be sold on Monday, the fifth day
of June, 1876, to pay the delinquent assessment, together
with costs of advertising and expenses of sale.

F. E. LUTY, Secretary.
Office, 507 Montgomery street, San Francisco, Cal.

**Peytona Gold and Silver Mining Com-
pany.** Location of works, Virginia District, Nevada.
Location of principal place of business, San Fran-
cisco, Cal.

Notice.—There are delinquent upon the following
described stock, on account of assessment, levied on
the 25th day of March, 1876, the several amounts set
opposite the names of the respective shareholders, as
follows:

Names.	No. Certificate.	No. Shares.	Amount.
A E Head.....	1	100	\$ 5 00
W W Stetson, Trustee.....	2	100	5 00
W W Stetson, Trustee.....	4	19,000	950 00
T J Owens.....	7	40,000	4000 00

And in accordance with law, and an order of the
Board of Directors, made on the 25th day of March,
1876, so many shares of each parcel of said stock as
may be necessary, will be sold at public auction, at
the office of the company, room 5, No. 215 Sansome
street, San Francisco, Cal., on the 13th day of May,
1876, at the hour of one o'clock p. m., of said day, to
pay said delinquent assessment thereon, together with
costs of advertising and expenses of sale.

T. J. OWENS, Secretary.
Office, Room 5, No. 215 Sansome street, San Fran-
cisco, Cal.

To Mining Secretaries.

An amendment to Section 335 of the California Code,
taking effect July 1st, 1874, provides that in ad-
dition to the regular publication, daily or weekly,
of the assessment and sale notices as heretofore,

PERSONAL NOTICE

Must be served as provided in the following quotation
from the law:

"The notice must be personally served upon each
stockholder, or in lieu of personal service, must
be sent through the mail, addressed to each stock-
holder at his place of residence, if known, and if
not known, at the place where the principal office
of the Corporation is situated."

The above refers to the ASSESSMENT NOTICE only.
Advertisers in the MINING AND SCIENTIFIC PRESS
will be furnished with copies of assessment notices
printed on slip suitable for serving personal notice
under this law at short notice.

DEWEY & CO., Publishers.

NOTICE.

A Quartz Mine and Mill For Sale.

The Mill containing one five stamp battery, free
water power. Sample of rock from the Mine can be
seen at the MINING AND SCIENTIFIC PRESS office, San
Francisco. Location: Oregon Gulch, near Oroville,
Butte county, Cal.

About thirty or forty tons of Quartz are already out
and every day are taking out more.

A. GRUMMET.

SUTTER CREEK, February 26th, 1875.

MESSES. DEWEY & Co.—I have received my Letter,
Patent through your Agency. nd, for your prompt
ness, accept my thanks. Yours,
S. N. KNIGHT.

Natural History of the Seal.

At the meeting of the Academy of Sciences held on Monday evening last, Capt. C. Bryant, Government agent on the islands where alone the fur seal is obtained on any spot of territory under the jurisdiction of the United States, gave a statement of the sealery, and the habits of the animal toward which so many ladies of this State and the rest of the world have reason to feel under obligations. The sealery has been leased for 20 years to the Alaska commercial company, of which period seven years have expired. For this privilege the company pays the Government \$3.17 per skin, and being limited to 100,000 skins annually, the revenue accruing to the Government is \$317,000, or just sufficient to pay a small interest on the Federal investment in Alaska. Only the males are killed, and as this seal is polygamous, there is no danger of the species being exterminated. They are killed at their third year, when the fur is in the best condition, and just before they attain puberty, a condition of their existence which marks a deterioration of the fur.

The Males Reach the Islands

About the 10th of April, and are rarely more than four or five days behind time. The first of the females arrive on the 15th of June, and they give birth to their young from 10 to 24 hours after landing. All the females have landed by the 25th of July. The seals remain on the islands four months, eating no food during the whole time, and gradually getting thinner. Then they go away with the young, the males separately and the females separately, and where they go to is a problem. They go eastward and southward, and in the same way return. Nothing is known of their habits after leaving the islands. A strict herd or family relation is maintained, and the members of one family do not invade the domain of another family. The numbers are prodigious. A calculation in 1869 gave 1,130,000 females; the same method of calculation last summer gave 1,800,000, or an increase of five per cent.; 45 days old the pups begin to swim, four months old they can take care of themselves. Why the fur seal confines itself to these islands is probably due to the peculiarly favorable climate, not existing anywhere else on the North Pacific American territory. Twenty years ago

The Seals Got Scared

By too much killing and interference, and were gone three years. They did not all return. The absentees founded a colony near the Kamshatka shore, on the islands of Behring and Copper, and now their numbers amount to about one third of those on the Priveloff group. The mode of killing the three-year-old males with clubs is by driving them off in herds and allowing the older and younger ones to escape; the mode of skinning the carcasses and curing the skins, an account of the Aleuts who inhabit the islands, the strict care taken not to exceed the annual allowance of 100,000 skins, even for the sake of food to the natives—all this was dealt with carefully in the latter portion of the lecture. A few questions were answered, and a vote of thanks was passed to Captain Bryant.

LEVI STRAUSS & CO.,

Patent Riveted

Clothing,

14 & 16 Battery St.,
San Francisco.

These goods are specially adapted for the use of FARMERS, MECHANICS, MINERS, and WORKING MEN in general. They are manufactured of the Best Material, and in a Superior Manner, and in a trial will convince everybody of this fact.



Patented May 12, 1873.
USE NO OTHER, AND INQUIRE FOR THESE GOODS ONLY.

F. MANSELL & CO.,
SIGN PAINTERS,423 PINE STREET,
(Between Montgomery and Kearny.)

Persons engaged in the following business can have their Signs Painted at contract prices, for goods or articles in which they trade, viz:

Merchant Tailors, Gents' Furnish'g Goods,
Bootmakers, Furniture Dealers,
Hatters, Jewelers,
Hotels, Piano Fortes,
Wine Merchants, Etc., Etc.

PACIFIC RURAL PRESS,

A first-class 16-page Agricultural Home Journal, filled with fresh, valuable and interesting reading. Every farmer and ruralist should take it. It is immensely popular. Subscription, \$4 a year.

DEWEY & CO., Publishers,
No. 224 Sansome street, SAN FRANCISCO.

Giant Powder.

Patented May 26, 1868.

THE ONLY SAFE BLASTING POWDER IN USE.

GIANT POWDER, NO. 1,

For hard and wet Rock, Iron, Copper, etc., and Submarine Blasting.

GIANT POWDER, NO. 2,

For medium and seamy Rock, Lime, Marble, Sulphur, Coal, Pipe Clay and Gravel Bank Blasting, Wood, etc.

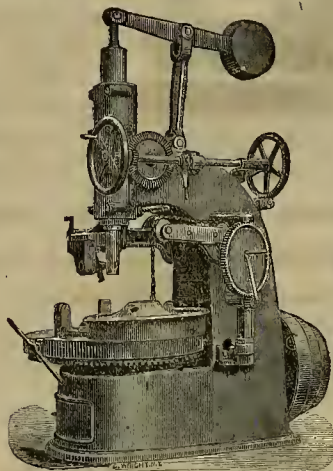
Its EXCLUSIVE use saves from 30 to 60 per cent. in expenses, besides doing the work in half the time required for black powder.

The only Blasting Powder used in Europe and the Eastern States.

BANDMANN, NIELSEN & CO.,

General Agents, No. 210 Front Street.

v22-3m16p



No. 4 Car Wheel Borer.



We have the best and most complete assortment of

Machinists' Tools

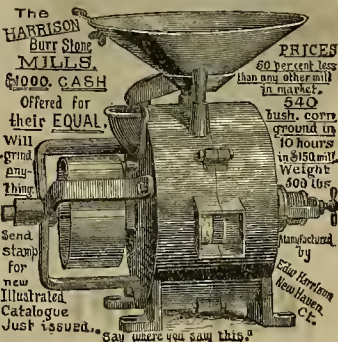
In the Country,

Comprising all those used in

MACHINE, LOCOMOTIVE, AND

R. R. REPAIR SHOPS.

For Photographs, Prices and Description, etc., address

NEW YORK STEAM ENGINE CO.,
98 Chambers Street, New York.

PRICES
60 percent less
than any other mill
in market.
340
bush. corn
ground in
10 hours
in 1850 mill
Weight
500 lbs.
Manufactured
by
Carrington
New Haven,
Ct.

The
HARRISON
Burr Stone
MILLS.
\$1000. CASH
Offered for
their EQUAL.
Will
grind
any
thing.
Send
stamp
for
new
Illustrated
Catalogue
Just issued.
"Say where you saw this."

G. W. & C. A. LANE, Exeter, N. H., write, Dec. 13:

"We started the heavy 20-inch Corn Mill last Friday you sent to Baldwin & Tabor, Manchester, N. H. We ran it most all day, and ground 60 bushels corn per hour. The mill you sent us at Haverhill, Mass., for A. S. Hook, is doing wonderfully. It is grinding on an average 2,500 lbs. good meal per hour, and has ground 2,800 lbs. in an hour. It is driven by an engine with a 9-in. cylinder, and takes the place of a 30-in. mill of another kind that, when doing its best and loading the engine with all it could carry, only ground 1,500 lbs. per hour. If there is a mill built that can beat that we would be pleased to see it brought out."

Iron and Machine Works.

THOS. PENDERGAST.

HENRY S. SMITH.

ÆTNA IRON WORKS.

MANUFACTURERS OF

IRON CASTINGS

and MACHINERY.

OF ALL KINDS.

Fremont Street, bet. Howard and Folsom,

SAN FRANCISCO.

THE RISDON

Iron and Locomotive Works,

INCORPORATED.....APRIL 30, 1868.
CAPITAL.....\$1,000,000.

LOCATION OF WORKS:

Corner of Beale and Howard Streets,
SAN FRANCISCO.

Manufacturers of Steam Engines, Quartz and Flour Mill Machinery, Steam Boilers (Marine, Locomotive and Stationary), Marine Engines (High and Low Pressure). All kinds of light and heavy Castings at lowest prices. Cams and Tappets, with chilled faces, guaranteed 40 per cent. more durable than ordinary iron.

Directors:
Joseph Moore, Jesse Holladay, O. E. McLane,
Wm. Norris, Wm. H. Taylor, J. B. Haggin,
James D. Walker.

WM. H. TAYLOR.....President
JOSEPH MOORE.....Vice-President and Superintendent
LEWIS E. MEAD.....Secretary

The Phelps' Manufacturing Co.,

MANUFACTURERS

OF ALL KINDS OF CAR WARE,

Machine Bolts, Bridge Bolts and Ship or Band Bolts.

13, 15 and 17 Drumm Street, San Francisco. 4v21y

WM. HAWKINS.

T. G. CANTRELL

HAWKINS & CANTRELL,

MACHINE WORKS,

210 & 212 Beale St.,

Near Howard, - - - SAN FRANCISCO.

MANUFACTURERS OF

Steam Engines and all kinds of Mill and Mining Machinery.

Also manufacture and keep constantly on hand a supply of our

Improved Portable Hoisting Engines,

From Ten (10) to Forty (40) Horse Power.

N. B.—Jobbing and Repairing done with Dispatch.

FULTON

Foundry and Iron Works.

HINCKLEY & CO.,

MANUFACTURERS OF

STEAM ENGINES,

Quartz, Flour and Saw Mills,

Hayes' Improved Steam Pump, Brodie's Improved Crusher, Mining Pumps, Amalgamators, and all kinds of Machinery.

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RAILROAD AND OTHER IRON

Every Variety of Shafting,

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HAMMERED IRON

Of every description and size.

Orders addressed to PACIFIC ROLLING MILL COMPANY, P. O. box 2023, San Francisco, Cal., will receive prompt attention.
The highest price paid for Scrap Iron.

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Quicksilver Condensers and Furnace Castings.

Sole manufacturers of the Hepburn Roller Pan and Callahan Grate Bars, suitable for Burning Screenings.
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CROSS' PATENT BOILER FEEDER AND SEDIMENT COLLECTOR

Dunbar's Patent Self-Adjusting Steam Piston

PACKING, for new and old Cylinders.

And all kinds of Mining Machinery.

Front Street, between N and O streets,
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SHEET IRON PIPE.

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Corner Howard and Beale Streets,

Are prepared to make SHEET IRON and ASPHALTUM PIPE, of any size and for any pressure, and contract to lay the same where wanted, guaranteeing a perfect working pipe with the least amount of material.

Standard sizes of railroad Car Wheels, with special patterns for Mining Cars. These small wheels are made of the best Car Wheel Iron, properly chilled, and can be fitted up with the improved axle and box—introduced by this company, and guaranteed to outlast any other wheels made in this State.

All kinds of Machinery made and repaired.

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Brass Foundry & Pump Factory.

A. J. SMITH, Plumber,

Sole Proprietor and Manufacturer of the

Celebrated Hudson Force Pumps, Atwood & Bodwell Windmill Brass Pumps, Smith's Copper-Lined Pumps, Plumbers' Force Pumps.

Special attention paid to Brewers', Distillers', Beer and Hot Liquor Pumps, and Wine Pumps. Particular attention paid to AIR PUMPS, also to

DIVERS' SUBMARINE PUMPS.

Artesian Well Pumps Made to Order.

Brass Castings Made to Order.

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All kinds of Brass, Composition, Zinc, and Babbitt Metal Castings. Brass Ship Work of all kinds: Spikes, Sheathing Nails, Rudder Braces, Hinges, Ship and Steamboat Bells, and Gongs of superior tone. All kinds of Cocks and Valves, Hydraulic Pipes and Nozzles, and Hose Couplings and Connections of all sizes and patterns, furnished with dispatch.
PRICES MODERATE.
J. H. WEED, V. KINGWELL.

California Machine Works,

119 BEALE STREET, SAN FRANCISCO.

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Builders of QUARTZ, SAW AND FLOUR MILLS

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THE ECONOMY HYDRAULIC HOIST for STORES, And General Machinists. 25v28-3m

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129 and 131 Beale street, between Mission and Howard, San Francisco.

LIGHT AND HEAVY CASTINGS.

of every description, manufactured 24v16g

Miners' Foundry and Machine Works,

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First Street, bet. Howard and Folsom, San Francisco.

Machinery and Castings of all kinds.

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Pioneer Screen Works,

Removed to 32 Fremont Street, near Market.

J. W. QUICK,

Manufacturer of perforated sheet metals of every description, at reduced rates. Mill owners using Battery Screens extensively, can contract for large supplies at favorable rates. This is the only establishment on the Coast devoted exclusively to the manufacture of Screens





GOLD MEDAL

AWARDED TO

San Francisco Steam Pumps.



AFTER ONE OF THE
MOST THOROUGH TRIALS

Ever Had in the United States,

BETWEEN COMPETITORS

—OF—

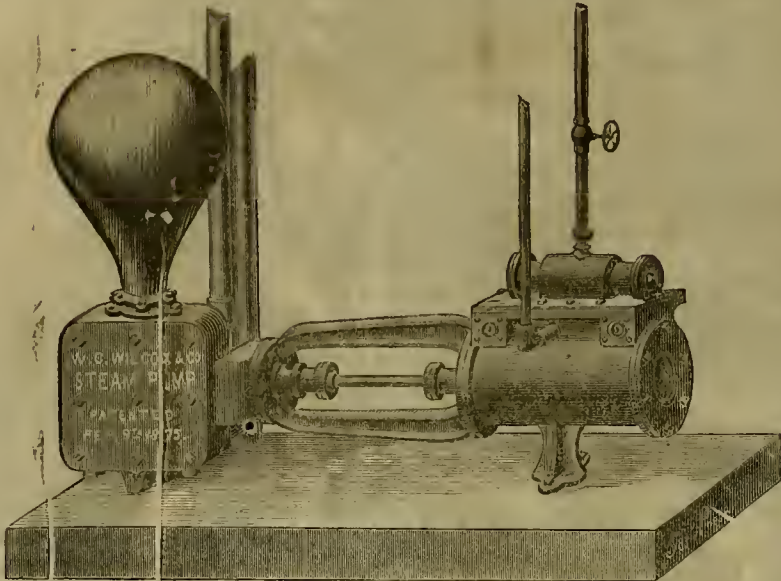
Best Established Reputation,

In which, at great expense, the different Steam Pumps were tried under every test known to experts, the Examining Committee of the Tenth Industrial Fair of the Mechanics' Institute have awarded to us their

GOLD MEDAL

—FOR—

Best Steam Pumps on Exhibition.



We are prepared to furnish PUMPS UNDER CONTRACT, guaranteeing their ability to perform any specific work for which steam pumps are adaptable, such as

RAISING WATER FROM MINES,

FOR WATER WORKS,

FEEDING BOILERS, RAISING WATER FROM WELLS; STEAMER AND SHIP PUMPS, ETC.

We would also call the attention of those interested, to our Direct Acting Deep-Well Pumps for raising water from

Any Desired Depth.

Also to our Especial Construction of Pumps FOR HANDLING QUICKSILVER or heavy liquids.

We claim that our Pumps are the best ever made in simplicity of construction, economical use of power, durability and perfect adaptability for general uses, and we ask all persons interested to investigate our title to this claim. Salesrooms at our Machine Shop, 114 and 116 BEALE STREET, SAN FRANCISCO.

W. C. WILCOX & CO., Proprietors.

BEFORE PAINTING YOUR HOUSES

Send for Sample Card and Circular and Carefully Examine the

AVERILL CHEMICAL PAINT, MIXED READY FOR USE.

This Paint is prepared in liquid form, READY FOR THE BRUSH. It requires no addition of oil or spirits. It is composed of the best materials known to the trade—Pure Linseed Oil, Strictly Pure White Lead, Pure Zinc, and the finest of coloring matter for tinting. It is the BEST, CHEAPEST, MOST DURABLE AND BEAUTIFUL PAINT IN THE WORLD. Is just what is wanted by every farmer, mechanic and everybody who has a house, fence, barn, or wagon to paint. Requires no skilled labor, as any one can apply it who can handle a brush. It is put up in cans of any required size, from a quart to five gallons, and is sold by THE GALLON. It gives a firm, elastic and brilliant glossy finish, and will neither crack, peel or wash off, like most paint in common use, but is proof against rainstorms and all action of the elements. Buildings painted with this paint five years ago look fresh and like new to-day and will need no more paint for years. Of no other paint can this be said and proved.



The Averill Chemical Paint Company supply a long-felt want. They not only furnish a Paint more lasting, handsomer, and at the same time cheaper than the best of others, but it is in a liquid form—white and all the fashionable and most exquisite shades—ready for the brush. So that farmers, in fact everybody, can be their own painter if necessary. Indeed, all the buildings upon which the Averill Chemical Paint has been applied, are marvels of beauty.—*Christian Union.*

We know of no subject of such importance to householders as that of a good, handsome, durable paint for their dwellings. Within the past few years we have watched the progress of the Averill Chemical Paint and have had frequent opportunities to test it fully. We think it just the article to supply the need, and give it our hearty endorsement.—*N. Y. Independent.*

From the Thousands of Testimonials sent us, we select the following, which we present for your careful consideration:

A PAINT FOR FARMERS.—Prof. J. D. Turner, Jacksonville, Ill., is a man of great practical knowledge and experience; hence, we attach a great deal of value to the following, from his pen, which we find in the *Prairie Farmer*:

"Some two years ago I sent for and got from a barrel to a harrel and a half of Averill Chemical Paint, of light dun color, which I thought would suit me well enough for all work—houses, doors, blinds, fences, bee-hives, wagons, tools and all. I put two coats upon my residence here, and run over three or four of my smaller farm houses on my farms. With what was left I painted my bee-hives, wagons, wheelbarrows, rollers, harrows, fences, etc., etc., and on all these buildings, implements, tools, gates, etc., the paint is as hard and glossy to-day, as far as I can see, as it was a month after it was put on, and holds its own at least for five years to come, (if not ten of them,) better than ordinary white lead and oil does for even two years.

"I have watched it now for about two years with interest and care, and have never found a single spot where it peeled, cracked, or chalked off, as our other paints do. Others who have used this paint like it equally as well. But the point is, I can take one and the same key and brush, and go over all my buildings, wagons and tools, with no needless waste of paint, brushes or time. It is quite as good for inside finish, as it leaves a coat that shines and washes like glass."—*Moore's Rural New Yorker.*

THE AVERILL PAINTS.—In reply to some inquiries of our readers, we would state that we have given three paints, prepared by the Averill Chemical Paint Company, a full trial, and they appear to possess all that is claimed for them; spreading easily, adhering well, drying soon, and imparting handsome shades of color to the surface covered. Farmers and others who do their own painting, may avail themselves of the convenience of purchasing these paints, of any desired shade, already mixed for use, at a very reasonable price.—*Cultivator and Country Gentleman.*

PLACERVILLE, October 7, 1875.
To THE CALIFORNIA CHEMICAL PAINT CO: Gentlemen—In reply to your letter I have to state that for more than six years I have dealt in and used your paint. I have during that time carefully observed its application and use, and from practical knowledge can certify to its unrivalled excellence. During my six years' acquaintance with it, there has not come to my knowledge a single instance of failure in any case where it has been used. All to whom I have supplied it unite in commending it for its superior claims over all other paints now in use. The Averill Paint externally used, or, in other words, exposed to the action of the weather, neither runs off nor changes color, as do other paints, and will retain its freshness and adhesive property for years. Pure lead and oil will in a short time become dry, and are easily rubbed off; the loss of oil leaves the lead in a dry, oxidized state. As a matter of economy the claims of the Averill Chemical Paint to popular appreciation and general use are beyond question. A house properly painted with it once will be better preserved, and present a neater appearance at the expiration of seven years, than it would if twice coated with lead and oil paints now in use. There can be no question, then, that to use it is both labor-saving and economical. So well assured and convinced am I of its established right to this distinction over all kinds, that had I fifty houses of my own to be painted, the "Averill" alone should be my choice and used.
Yours, very truly,
S. J. ALLEN, Druggist.

UNIVERSITY OF CALIFORNIA, BERKELEY, August 16, 1875.
To THE CALIFORNIA CHEMICAL PAINT CO: Gentlemen—In reply to your note of the 13th inst., I willingly state that the work done by you in painting the exterior of the North Hall or College of Letters is in every way satisfactory, and the appearance of the building since it was painted excites the favorable comment of all who have seen it. As I have had occasion to use the Averill Paint before, my experience has been such that I prefer it to any and all others when properly applied. I am very truly yours,
ROBT. E. C. STEARNS.

Sample Card of Colors Sent Free on Application. Be Sure and Write for One and Examine for Yourself before Buying Any Other.

CALIFORNIA CHEMICAL PAINT CO.

117 PINE STREET, SAN FRANCISCO.

SEVERAL FIRST-CLASS SEWING MACHINES can be had at favorable rates to the purchasers, if ordered soon, from the Grangers' Business Association, N. E. Cor. Davis and California streets, S. F.

THE MINING AND SCIENTIFIC PRESS is one the best papers published on this coast. It should be in the hands of every miner and mechanic in the State. The issue of last week contained an excellent article on the old product of this coast.—*Oroville Mercury, Jan. 28.*

\$5 to \$20 For Day at home. Terms free. Address G. STINSON & Co., Portland, M.
Dewey & Co. { 224 } Patent Agt's.

ANGELL'S CHARCOAL DENTAL SOAP for Whitening and Preserving the Teeth. J. W. ANGELL, Prop., San Francisco.

HERCULES POWDER.



HERCULES Slaying the Giants.

[Hercules, the son of Jupiter and Alcmene, was descended directly from the Gods. He performed more wonderful deeds of strength than any of the heroes of old. On one occasion, he was sent by Eurystheus to execute a very great task, when he found himself opposed by several Giants among whom were the powerful Giant Geryon, Eurytion, a Monster with three heads and six arms, and the two-headed dog, Orthus. All these he slew with his club. He then came to a high mountain, which, with one blow of his club, he broke from summit to base, and thereby made an entrance into the Mediterranean Sea, through the Rock of Gibraltar, the Straits of which are known to this day as the Pillars of Hercules.]

We wish to call the attention of Miners and others to a few points of the superiority of **Hercules Powder** over all other strong Explosives:

1. Its strength is greater than that of any other in use. The materials of which it consists are compounded upon strictly scientific principles, and are not a simple neutral absorbent employed that will hold a quantity of Nitro-glycerine. It is the opinion of the best chemists to whom the matter has been submitted that no mixture has been employed that so thoroughly promotes the whole tremendous force of the explosives employed, and at the same time neutralizes the offensive gases caused by the explosion. With this powder one-half the time is saved that is lost by using any other strong Powder, before you can resume work after a blast.
2. **UNIFORMITY.**—The materials of the mixture are chemically prepared, and therefore, great uniformity can always be depended upon and the best results obtained. This is a great advantage over any that varies in its strength as those must which are mixed with any natural earth.
3. **SAFETY.**—So perfect is this mixture that no accident can happen with it from premature or accidental explosion, if persons will half follow the rules laid down for its use. No Powder has ever been invented where so few accidents have happened with it in proportion to the quantities which have been used.
4. **CARTRIDGES.**—It is well known that nitro-glycerine has a tendency to decompose by volatilization. These are the "fumes" that are smelled on going into a close warm drift, or room where nitro-glycerine powders are stored. To prevent the escape of these "fumes" an almost hermetically sealed cartridge is employed, and so effectually is it, that some cartridges filled with Hercules were exposed to a blazing California sun for six months in summer, with no perceptible loss of strength. This is a great advantage over the open porous paper generally used for cartridges.
5. **ECONOMY.**—We believe that any miner who will take the trouble to investigate the matter will satisfy himself that full 15 per cent. is saved by using the HERCULES over any other strong Powder manufactured.

Query. Is this worth saving? We should think so. Try it. {Hercules X X No. 1, for extreme hard rock.
Hercules X X No. 2, for medium hard rock.

The GREAT SUCCESS of the HERCULES POWDER naturally aroused a strong opposition to its use, and litigation in defense of its rights become necessary. We would therefore call the attention of the public to the FINAL DECISION in the U. S. Circuit Court of the whole matter in favor of the California Powder Works, *which explains itself*:

DECISION OF THE COURT.

At a stated Term of the Circuit Court of the United States of America of the Ninth Judicial Circuit, within and for the District of California, held at the Court Room thereof, in the City and County of San Francisco, on Wednesday, the sixth day of October, A. D., 1875.

Present:—Honorable Stephen J. Field, Associate Justice of the U. S. Supreme Court; Honorable Lorenzo Sawyer, Circuit Judge.
THE CALIFORNIA POWDER WORKS, *Ex AL.*, *In Equity*, No. 1,233—The Court having, on the 22d day of September, A. D., 1875, being a day in the July Term, A. D., 1875, of said Court, sustained the demurrer of the defendants to the complainant's amended Bill of Complaint herein, will leave to complainant to amend its said bill on or before the next succeeding rule day, and the said time granted complainant within which to amend its said bill having expired, and the default of said complainant to amend its said bill having been duly entered, and the Court having on the sixth day of October of the said term and year, on motion of C. R. Greathouse, Esq., Solicitor for defendants, M. A. Wheaton, Esq., Solicitor for complainant, being present, in open Court, and declining to amend his said bill of complaint, he having elected to abide by his said bill of complaint as filed in this cause, ordered that a decree be entered herein dismissing said bill.

Thereupon, upon consideration thereof, it is ordered, adjudged and decreed, that the complainant's said bill be, and the same hereby is dismissed, and that the said complainant pay the said defendants their costs in this behalf expended.

October 18th, 1875.

(Signed) LORENZO SAWYER,
U. S. Circuit Judge Ninth Circuit.

L. S. B. SAWYER, Clerk.
By J. F. O'BRIEN, Dep. Clerk.

ENDORSED:—Filed and entered, October 18th, 1875.

Sold by THE CALIFORNIA POWDER WORKS, 314 California Street, San Francisco, Cal.

Also, all grades of Black Powder, Fuse, Shot, Caps, Etc.

MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO.,
Patent Solicitors.

SAN FRANCISCO, SATURDAY, MAY 6, 1876.

VOLUME XXXII
Number 19.

Crushing and Amalgamating Machinery of the Fryer Process.

In accordance with our promise in our issue of January 29th, we present our readers with a description and cut of the system of pulverization and amalgamation as practiced at the Fryer Works.

While we are not willing to indorse the Fryer process without a thorough knowledge of its operation, we open our columns to its managers to give our readers farther information by the accompanying engraving and description. We are informed that their works at Grass Valley are now open to public inspection.

As with our description of the furnace, published in the SCIENTIFIC PRESS of January 29th, we will give almost the exact language of the specifications, which cannot well be improved.

This invention relates to means by which ores containing gold and silver, in a free state, can be pulverized without amalgamation, or amalgamated after pulverization; or, at the same time and by one operation, be both pulverized and amalgamated.

Single Chamber.

A chamber is arranged to rotate, revolve, or oscillate upon or about a horizontal axis, and a weight or ram so placed within the said chamber that by the rotation, revolution or oscillation of the said chamber, the weight or ram will be caused by gravitation to have a reciprocating motion, falling from one end of the said chamber to the opposite end thereof. This weight or ram may operate to produce pulverization, or amalgamation, or both; after the ore has been placed within the said chamber, by falling upon the ore at the opposite ends of the said chamber, or by subjecting the ore to attrition between the weight or ram itself and the sides of the chamber.

Radial Chambers.

There may be a series of chambers around a transverse axis, about which they move, and a series of weights or rams arranged to reciprocate by gravitation within the said chambers, operating essentially as in the single chamber above described. Such combination of a series of chambers and their contained weights or rams moving around or about a common axis enlarges the working capacity of the apparatus, without inconveniently adding to its bulk, or to the space required for its operation. These radial chambers may be set either on a conical block, as represented in the cut, or on an octagon. These may be duplicated or the shaft as far as convenient.

Combination Chambers.

There may also be a centrally arranged separate amalgamating chamber, from which radiate a series of pulverizing chambers, with contained weights or rams, the said chambers moving about or around a transverse axis, common to them all.

By these means ores may be pulverized or amalgamated without loss of ore or metal contained therein during such treatment.

Having thus given the objects and nature of this invention, its construction will be more readily understood by reference to the accompanying engravings.

Single Chamber.

Fig. 2. A, working chamber, closed by ends or heads, C C, and supported and traveling upon trunnions, b b, to one of which prolonged is attached a gear wheel driven by a pinion. D' D', longitudinal bolts binding together the heads, C C. G, door or stopper, secured by cotter bar, f, and stirrups, g g, and rack wheel. E, weight or ram, which by its own gravity reciprocates from C to C as the chamber moves. For charges of about 250 pounds of ore A is about 5 feet by 20 inches, and revolves about 10, E then weighing about 230 pounds.

Radial Chambers.

Fig. 1. A represents a series of chambers, each with its containing weight or ram, E. In this plan, E slides upon guide bars D, and is of different shape from Fig. 1. Either or other forms of E can be used as circumstances require. G, doors or openings as in Fig. 1, c,

wheel, and d, pinion, by which power is applied. When it is desired to pulverize and amalgamate separately, the chambers, A, may be used for the former, whence the pulp may be admitted through the valves or doors, G' G', into the separate amalgamating chamber, I, to which, h h, are discharge doors or valves.

When using either form of chamber the ore is introduced through G in pieces of from brick

Don't Wait.

EDITORS PRESS:—You promised us long since that you would give us the full particulars of the Fryer process. We have waited and become impatient. We must have a mill of some kind. If Mr. Fryer has not completed his process so as to bring it out for sale, we will be

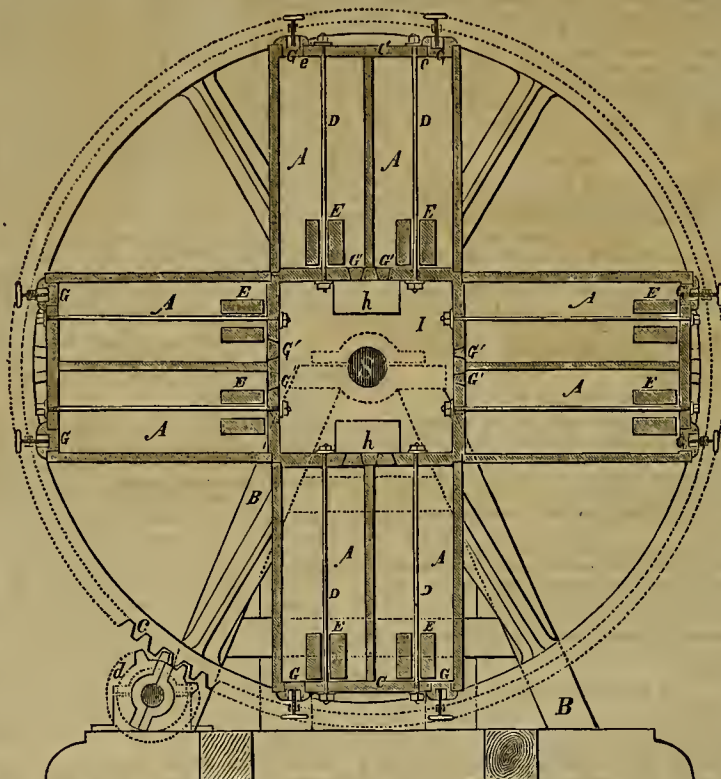


FIG. 1. THE FRYER PROCESS—CRUSHING AND AMALGAMATING CHAMBERS.

size downward, with a proportionate quantity of warm water, quicksilver and necessary chemicals, and then the apparatus is set in motion. The weight or ram, E, reduces the ore both by percussion and attrition. When the

compelled to try some other process. The gold in our quartz is fine, and we fear we cannot save it on the old fashioned stamp mill. We have no base metals to contend with.

We would say that any information in regard to the best process for working quartz and saving fine gold would be of importance to us.

H. C. COBY,

Etna, Siskiyou County, Cal., April 21st.

[If you have ore which will pay by any well known method, our advice would be not to wait for any new process. If you make your rock pay by an ordinary process, whenever a superior one is proven will be the best time for you to adopt it. We do not believe that even Mr. Fryer himself has advised any one to delay their work for his process.—EDS. PRESS.]

SELF-BLASTING ROCK—A STRANGE PHENOMENON.—The following curious statement is an extract from a letter dated "San Dimas, near Salinas, March 15th, 1876." The locality referred to is the Candelaria tunnel, of the Durango mining company: "At present there is on the 'Obra' one of the most singular effects manifesting itself that I ever heard of—the rock shoots or blasts of itself. It is very hard and solid, and will suddenly break with a noise much louder than a powder blast, and pieces fly with great force from 12 to 15 feet, as much as five or six tons having fallen at a single blast. Last week I had to stop work and timber, as one of the men was hurt by a 'natural blast,' and the rest refused to work. I want you to understand that these blasts are entirely different from 'caves,' the solid rock suddenly springing out from the face with a noise louder than that of a blast, and a force sufficient to hurt a man. They say that the same occurred at Tomlin, just before they struck the great bonanza. A. V. T."

JUNIOR McKEE has decided the laundry ordinance to be unjust and unreasonable.

The Silver Question.

[By ALMARIN B. PAUL.]

Well, Mr. Jones has finally delivered his silver speech, all of which is pointedly boiled down by the New York Times into "Buy my Silver." For so long a speech on so heavy a subject, it falls very light and adds but little, if any, to Mr. Jones' reputation as a political economist or statesman. To go into an analysis of this speech, and to combat his position for a double standard, would occupy more time than I have to spare, at present at least; and now comes forth Mr. Sharon, who makes (so the telegraph says) the important discovery that our government bonds do not say gold coin, but simply coin, "and this may have some weight" in carrying the double standard measures through. What is the inference? that our bonds can be paid in silver! When we take into consideration the fact that Germany is the largest holder of our bonds—that Germany nobly came forward, during our war, and backed us up with her gold; and in view, too, of her considering the demonetization of silver, it should be beneath the dignity of the United States Senate to hint at such an idea as the paying of our bonds in silver.

If better reasoning and propositions cannot be adduced for relieving the silver market, it will have to stand its discomfit. The fact is, our statesmen have got to look in a new quarter on the silver question before any relief comes of a permanent character.

All the intellectual stamina in the U. S. Senate cannot devise any law to force it where it is not wanted, excepting upon ourselves, and to force it upon ourselves is exactly what Europe would like to see, as then their silver would come in, and our gold by it be drawn out.

What we, as a silver producing country, have got to do, or rather should do, is to turn our minds towards India, study her trade and commerce, and through this channel pass off our surplus silver. India, in the past 26 years, has absorbed, of European silver, over \$1,000,000,000, and could take yearly more than the Pacific coast could produce. That more attention has not been given to the Indian commerce and exchange by our statesmen, commercial men and bankers is somewhat surprising.

With heads broad enough to grasp her trade, with the silver wealth which she covets at our hand, San Francisco, in a score of years, might make London fear the loss of the richest gem of her commercial crown; but alas, stock gambling is the grand idea of our millionaires, and the Cliff house the furthest their minds can range westward.

It must be evident that we have got to figure on the disposition of our silver outside of ourselves. To legislate it upon ourselves is but damming up the waters to overflow and engulf us by the loss of our gold; and what country offers so fine a field as the country which wants it, India? Knowing the product as I know it—knowing, too, how vast is the silver domain, and the great strides for its cheap production, I see the commercial world in less than a quarter of a century loaded up with it, and in such quantities unknown before in the world's history.

Well may Europe be exercised upon the subject, for they see the coming deluge. It is a question which is to puzzle the wisest. As before stated, with heads broad enough to grapple the Indian trade, San Francisco could be, with our silver, the queen of the commercial world—revel in effulgent splendor in this coming glittering age. Glittering age, do I say? Yes, through the light of statistics of the precious metals, I see the era close at hand which may well be termed the glittering age.

A GOON INEA.—A manufacturer of Springfield, Massachusetts, proposes to give young men and boys an opportunity to learn a trade by fitting a room with wood working machinery, benches, tools, etc., to be rented to those desiring to use them at a nominal charge of about one dollar a week, or fifty dollars a year and to furnish a competent overseer. He thinks that a boy could soon learn to make articles that would pay for his instruction, and he could learn mechanical drawing and practice with tools while in regular attendance at a day school.

Placer County Gravel Mines.

A correspondent of the Placer Argus is writing a series of articles on the mining interest, the last letter being from Iowa Hill. We extract the following information concerning that locality known as Bird's flat:

The Golden Gate, or Bowley & Jones.

This claim contains about 155 acres, most of which, large as it is, carries good hydraulic ground. It was first located in 1853, and drifted off and on nearly twenty years, paying enormously all the time. It was piped last year under the smallest rig, outside the rim, merely as a prospect, paying water money and wages; could be fixed up in first-class style for about \$4,000, giving 500 feet pressure, with all the water wanted. It would then employ eight men day and night for nearly a century at this biggest pay. Valued at \$10,000.

Medical Point, or Jones.

This claim contains about ten acres. It was piped from the beginning, and paid very well for the work done and the deficiency of power under which it was washed; in fact, the amount of ground worked under competent power, could be done in twelve days, yet it paid \$2,500. All this flat therefore, judging from actual developments, under proper appliances may be put down safely at from \$150 to \$200 a day. About \$1,000 would fix this claim up properly, and it would employ three men day and night seven years, supposing the pay not to run farther back than now expected. Valued at \$1,500.

In order to understand the extent of the present

Wealth of this Flat.

And the stretch of country from there to Wisconsin Hill, two miles south, throughout which the sniferous deposit is supposed to extend half a mile, or a mile, back from the canon into the hills, it is necessary to give my reasons for believing in that extent of rich gravel, as it has been doubted, perhaps is still, by men whose experience and knowledge I admit. In this stretch of country lie our best and largest claims, and yesterday's enormous clean-up of the Morning Star, located in the center, renders the question very interesting so far as the permanency of the splendid results of this season is concerned. Is it then, throughout the limits as it was on the present American river below from Rattlesnake Bar to Folsom, defined simply as a rim-rock deposit or a bark deposit of rich, reliable gravel in the basins behind? On the settlement of this question much of our future depends, and I therefore desire to avoid all exaggerated or deceptive ideas. For my own part I have always opposed the rim-rock theory, resting my opposition on science and practical experience. The gold found along the rim on the south side of Indian canon within the limits defined gives pretty strong evidence of belonging to the same rich lead found all through Menona flat, the base of Roach hill on the north side. If, as generally admitted, it is the same lead, then the configuration of the district would force it throughout Bird's flat in its passage south to the very base of the hills, though some of the claims at the extreme upper end may find themselves pinched in the extent of their pay dirt hereafter. Then, again, the lower section of the American river and the one in our neighborhood are distinct and separate formations, having no natural connection whatever; in fact, they were formed at different times and by different agencies. No one, accustomed to these investigations, will deny that the formation here is a part of that great pre-historic river, originally intersecting the entire northern portion of the State; a river of infinitely greater dimensions than anything known at present; or, that before Sugar Loaf gave way, and howed its once lofty head to its present limits, our auriferous territory was the bed of an immense lake, through which the river passed in its southern course to Yankee Jim's and Dardanelles by Georgetown, east of Centerville to Coloma, Placerville, Mokelumne Hill, down to the north of San Andreas gulch, 40 miles above Stockton, where it emptied into the great inland sea in a great measure contributed to form, and which was finally drained by the opening of the Golden Gate. Hence, the advocates of the rim-rock theory give no support in instantancing Whiskey, Dotens, Oondemned, Besle's Bars and Carrollton, where it was all rim-rock deposit, with Iowa Hill and vicinity, because the former are out of the passage of the great stream and belong to an entirely different period and agency. Besides, there is another theory in favor of our having a thoroughly auriferous gravel bed, which, individually, I strongly indorse. It is pretty well settled by geologists now, that rim-rock deposits are no evidence whatever of auriferous or non-auriferous gravel in the basins behind the ore, gold being deposited in the crust of the earth during the heated period of creation, while the igneous rock was soft; the others deposited through the gravel at subsequent periods by the eccentric action of water. This theory at once explains whatever was mysterious in our early California experience in finding heavy coarse gold in decomposed bedrock hundreds of feet below its present covering of gravel, and equally on finding a large extent of rich gravel above a barren bedrock. Evidently the two have no connection in natural law, and none, therefore, as they exist at Iowa Hill. But putting aside all scientific dicta, and turning to daily developments by practical experience, that great destroyer of human doubt and prejudice, do we not find everything tending to

establish the marvellous extent and richness of our hydraulic gravel range? Here are three of those developments: A fortnight ago, in washing gravel far enough back from the rim to test the question I am arguing, Dr. Kruse, at one end, washed up \$3,000 for a 20 days' run; the Swiss Boys, near the opposite end, \$3,500 for 13 days' run, and yesterday afternoon the Morning Star in the center, according to public report, about \$10,000 for 15 days' run. What more need I say? Nothing, except that according to actual experience this year, whether on the rim or off, if under the same splendid power used by these three companies, most of the claims on the entire range would run up the sum of pay the season through from \$150 to \$700 per day. So much for the rim-rock men who are conscientious in their judgment, and so much for the poor deluded ones below, who are not rational in their determination to see nothing but quartz worth investing in.

The tract of territory now spoken of, from Bird's Flat to Wisconsin Hill.

Besee no particular name, except that each point is known by the location upon it. Thus we come next to the Anstin. This claim contains 20 acres. It has been piped from this beginning, under 150 feet pressure and 200 inches of water, not sufficient to do first-class work, yet it paid two men good wages all through. At the cost of about \$800 it might be made to pay \$15 or even \$20 a day to the hand. The peculiarity of this claim is that it largely carries coarse quartz gold, very rough. A fine specimen, weighing nearly two ounces, and containing about \$20 in gold was found the other day, yet there is no evidence of a quartz vein in the district. The question then comes, could another ancient stream have joined the main river here from the neighborhood of Green valley, eight miles above, where I know there is quartz? Properly fixed up this claim would employ three men seven years. Valued at \$3,000.

The Swiss.

This claim contains 80 acres. It was drifted in early times and yielded largely, one piece of pure gold weighing about twelve pounds being found. For the last six years it has been under the pipe, well fixed up at a cost of \$4,000, with 200 feet pressure and 200 inches of water, and paid in that time about \$40,000. The last clean-up, three weeks ago, amounted to \$3,300 for 13 days' run. Employ's three men by day only, but if put under the power it admits would employ four men day and night for 20 years. Valued at \$15,000.

The Morning Star

Contains 160 acres under U. S. Patent. As the principal owners do not reside here I shall say but little about it. It is an old drift claim of reputation, with an immense bank of gravel, put under the pipe this season at a total cost of \$20,000. It has realized expectations, and proved itself the crack claim of the county. If not one of the banner claims of the State. As I have already said the clean-up on Saturday, according to public report, amounted to something like \$10,000 for 15 days' run. Its power is 500 feet pressure, with 1,000 inches of water. At present it is impossible to put any value upon it. In fact, it speaks for itself and the district too.

The Occident or Kidder Claim.

Contains 150 or 200 acres, of which 75 are known to be good hydraulic ground. Lying as it does between the Morning Star on one side and the De Kruse claim on the other, it may be considered in every respect, especially in its fitting up and arrangement, the second best claim in the district. It runs two monitors, with 400 feet pressure and 650 inches of water, 115 boxes on the flume and four under-currents. The last clean-up immediately after the sad accident to the late Mr. Kidder, as near as I can hear, was over \$4,000 for 23 days' run. I estimate the present run at over \$6,000. Total cost of fixing up \$5,000. It now employs nine men for day and night, and will last many years. This is one of the five claims that have settled the rim-rock question. Valued at from \$25,000 to \$30,000.

The De Kruse Claim

Contains 25 acres. It was prospected by shaft in early times, and put under the pipe in 1870, since which time it has paid very largely, excepting last season when there was such a sad want of water. This season it has averaged about \$3,000 to the run. It is worked under 300 feet pressure and 200 inches of water, with 800 feet of flume and three under-currents, the entire fitting up costing about \$4,000. It employs ten men at present, but averages eight for day and night. It will last for years, and is valued at \$20,000.

J. W. SLEEPER & Co., of Connor Creek mines, Baker county, Oregon, recently struck a very rich body of ore. It is stated that in quality and quantity it excels anything heretofore struck in that famous mine. The ledge is eight feet wide, and the ore is taken from a depth of 300 feet. Of this body of ore three feet in width fairly sparkles with gold, and the balance of the ledge is good milling rock, which will run from \$15 to \$20 per ton. The mine is very easily worked, very little blasting being required. Rock can be taken out and milled at a cost of \$7 per ton, including the wear and tear of machinery. In a run of three days (five stamps), Mr. Sleeper cleaned up 70 ounces, which in bar was \$44 fine, gold.

The mines in Southern Nevada are reported as more promising than ever.

Mariposa Land and Mining Company.

We have received, says the Mariposa Gazette, a pamphlet of twenty-one pages, giving a statement of the affairs of this company, which we find to be exceedingly interesting, even to those who have no personal interest in this grand estate. Heretofore the mines upon it have been worked for what was in sight, without regard to system or science. The \$12,000,000 gold bullion taken from them during the past ten or twelve years is less than the yearly product will be under the improved and comprehensive plan by which it is now proposed to work the most promising of them.

A personal examination and survey of the main central belt of veins on the Mariposa estate establishes beyond controversy that they are a part of the far-famed mother lode of California. They first appear on Mount Bullion, a short distance south of the Merced river, and run thence easterly from section eight to twenty. They are known as the Second Specimen mine, the Coin Specimen, the Queen, the Crown Point, the Linde, the Pine Tree, the Josephine and the Princeton. They have been worked to various depths, the ore producing from \$8 to \$60 per ton. A close examination shows that for many miles the ground is undisturbed, although the veins are plainly exposed and in some cases rise above the surface and run for long distances like great walls of white quartz. The cost of working the mines on this property has been so heavy, owing to the plan of mining by shafts, which require costly hoisting and pumping machinery, and where firewood is scarce and dear, that none but the richest ores can be worked to advantage. The experiment of erecting large mills on the Merced river to be run by water power was then tried, but an expensive road had to be cut, and as much hoisting and pumping was required as before.

In 1868, Mr. Mark Brumagin, after having thoroughly examined the estate, its resources and capabilities, and considered the problems of engineering, mining and reduction involved, recommended the water power of the Merced river as the basis of operation, by means of which all the mills could be driven and all the mining machinery kept running at nominal expense. Mr. Brumagin's plans were submitted to the company and adopted, and surveys entered upon for the route of a mining and drain tunnel, two and a half miles long. Work was commenced on this tunnel, and at the present time it is progressing successfully, at the rate of 100 feet a month, which will be increased by improved machinery 50 per cent. by the first of May.

The financial condition of the company is represented as good. Its expenditures for the past year have been large, owing to the settlement of liabilities incurred by the old company, in order to perfect the present company's title to the estate. These liabilities once extinguished, will reduce the expenditures to a few thousand dollars per month, as the greater part of the work is done by mechanical appliances, operated by water power and compressed air. In case the mills do not commence to run in two months, and a sufficient amount of bonds are not sold to meet this obligation, the company will resort to another assessment.

We are pleased to learn from this expose of the company's affairs that work of the most substantial character will be shortly commenced on the Princeton shaft, the engines and boilers having been already placed on the ground for the purpose.

We take pleasure in testifying to the vigor, energy and industry displayed by the present superintendent of this estate, Mr. E. C. Burr.

The pamphlet concludes with the following: "The diamond cross-cut, No. 3, having passed through a fissure vein 27 feet wide, carrying 10 feet in width of gold ore of low grade, which increases in richness as depth is gained, insures the success of the company's operations in this locality, and renders the early production of bullion a certainty. The point at which this large vein was intersected is opposite to the 1,400-foot station, and the main tunnel is at this time within 50 feet of that point. A working cross-cut will be run from the main tunnel to the vein, and ore will be taken out.

"The mills are being put in order as rapidly as circumstances will permit, and the additional machinery now building in the East is well nigh completed, and will be shipped by the first of May. It is therefore hoped and expected that everything will be completed so that the mills can be started by the first of June, if not earlier."

CALIFORNIA DIVIDENDS.—The Virginia Evening Chronicle, of April 22d, has the following speculations upon the ability of California to pay a dividend in May: "In view of the opening of the California mine and the crushing of 300 tons daily of rock averaging \$500 per ton, the sanguine ones considered it absolutely certain that there would be a dividend in May upon the results of the April production. They figured that 300 tons of this kind of rock would give \$150,000 per day, and a 30 days' run would give \$4,500,000; a \$2 dividend would require but \$1,080,000, and even if the unprecedented dividend of \$5 per share were paid it would amount to but \$2,700,000, which would leave for the reserve fund over \$1,000,000 after paying all expenses." The Chronicle then goes on to say that as the San Francisco papers reported a few days ago that no dividend would be paid until June next, a Chronicle reporter called at the Virginia office of the company and ascertained that no such plan had been definitely settled upon.

Darwin, Inyo County.

J. A. Acklin, who has been residing at Darwin during the past winter, returned here on Monday last. He kindly gives us, says the Kern County Courier, a few items of interest from that new and much talked of mining district of our "back country." Joe went to Darwin for the purpose of familiarizing himself in mining matters by practical experience, that he might, when brought in contact with mining men, know what they meant when they would speak of "dipe, spurs and singles, shafts, tunnels, stopes, cross-cuts, winzes, chimneys, true fissures, blowouts," etc. He represents himself as being well pleased with his sojourn in Darwin and as satisfied with the future mining prospects of Inyo county.

Of the several mining companies now in working shape and demonstrated as permanent mining enterprises about Darwin he mentions the Defiance, New Coso, Coso Consolidated, Cuervo and Dorgan companies. In Lee district, 10 miles north of Darwin, is the Emigrant company, with a consolidation of several good mines, and they are now erecting a mill and will soon be in operation, turning out high grade bullion. In Lookout district, 10 miles east of Darwin, the Modoc company have found an immense body of first class ore and will soon have a furnace or mill erected.

The Defiance company, in which some of our own citizens have interest, have been doing the most successful work during the past four months of the winter season. Since the first of January last they have erected their furnace and kept it running continuously, and, as a master of course, contributed largely to the bullion shipments from Inyo. The Defiance has had the good fortune to have fine grade smelting ores in every portion of the mine where they have wished to sink shafts and run tunnels and drifts and cross-cuts—paying their way in all of the "dead work" it has been necessary for them to do to put their mine in proper condition for successful mining. They are at this time putting up extensive hoisting works and will in a short time add another furnace to facilitate the reduction of ores. The management of the company has been by men who have not had "too much" experience in mining, and consequently it has been a success.

The ores of the mines belonging to the New Coso company have recently improved in quality, and success will wholly depend on the management. They have two classes of ore, one suited for smelting and the high grade for milling.

The Coso Consolidated company is developing a new and encouraging feature at this time, it having gone down somewhat during the early part of the winter, owing to "too much" experience on the part of its first manager. It is now under the management of a party who will bring it out all right.

The Cuervo company have a very large surface property and it is believed that the developments of the next few months will enable them to make astonishing revelations of mineral wealth.

The Modoc company recently run into a body of ore in which, to use the language of one of the miners, "they could see trade dollars without any discount." It is claimed to be the richest deposit of silver ore ever discovered on the coast, and they have not yet got through it.

The Emigrant company are opening up fine milling ore, and was considered "way up" until the Modoc put in an appearance as "chief." The Emigrant will have its mill in operation about the first of June.

The Dorgan company have not yet developed anything "bonanzaic," but everything is encouraging.

Of the town of Darwin, Joe says, it has had a quick growth, but is now comparatively quiet, though there is but little complaint among business men. There are a large number of miners employed by companies, and of course they are consumers of the necessities and go for the luxuries when they are to be had—which, Joe says, we are sorry to say, do not often turn up in that dry, barren country.

DANGER OF OLD SHAFTS.—A correspondent of the Placer Argus, writing from Iowa Hill, in speaking of the De Kruse claim says: I suppose it is not too late to tell you of a singular and unpleasant incident occurring in this claim about a week since. On piping away the bottom of an old shaft they found the skeleton of some poor fellow, with his blankets tied up in the usual traveling style. It seemed to have been in a standing position before struck by the water, one foot retaining the boot afterwards. The cloths appeared to have been of a respectable character and evidently but little worn. The remains are supposed to be those of a man who made a part payment for a claim here, and then went to Yankee Jim's to draw \$1,500 he had on deposit there, but was never heard of afterwards. What a horrible fate! Yet there are many of these villainous man-traps in our vicinity, left wide open, which if ever washed to the bottom may tell a similar story. Whose business is it to see that the more dangerous ones are covered over? Nobody's, I suppose. Human life, I know, is not of much value in this country, yet common Christianity suggests that somebody may be held responsible hereafter. Messrs. Supervisors and Road Masters, how do you feel on the subject? Are your consciences satisfied? Yes?—well then so is mine.

The Black Bear mine at Salmon river has taken out \$14,000 during the last four weeks. Last summer the yield was \$26,000 per month.

MECHANICAL PROGRESS

The Centennial Engine.

The Philadelphia Times gives some interesting facts concerning the starting of the mammoth Corliss engine which will furnish the power in "Machinery Hall."

The contract between the Centennial authorities and George H. Corliss, of Providence, R. I., obliged the latter to have his great engine in Machinery Hall completed and ready for action by yesterday, the 10th of April. The announcement circulating through the grounds that in the evening this gigantic source of the motive power that will operate upwards of a dozen acres of machinery would be set in motion for the first time, a great crowd of employees and others congregated about the iron giant before five o'clock. Steam had been created in four of the twenty boilers required to feed the engine, and was turned upon the latter half an hour later.

The engine weighs 800 tons; will drive eight miles of shafting; has a fly wheel 30 feet in diameter and weighing 70 tons; is of 1,400 horse-power, with a capacity of being forced to 2,500 horse-power; has two walking beams, weighing 22 tons each; two 40-inch cylinders, a 10-foot stroke, a crank shaft 19 inches in diameter and 12 feet in length; connecting rods 24 feet in length, and piston rods six and one-fourth inches in diameter. The platform upon which it rests is 55 feet in diameter and composed of polished iron plates, resting upon brick foundations that extend far down into the earth. The height from the floor to the top of the walking beams is 39 feet. Of the eight lines of shafting (four on each side of the transept) seven will have a speed of 120 revolutions per minute and one of 240.

At precisely half-past six o'clock the Director General raised his arm as a signal, Mr. Corliss patted his huge iron pet as if it were a frisky nag that he was coaxing to move, when a slight puffing was heard, not near so loud as that of a railway locomotive when about to start, one of the beams began to descend, and the fly wheel to turn, and the engine was in motion. Without waiting for more, every spectator took his hat in his hand and swung it in the air, the action being accompanied by a cheer so deafening that nothing could exceed it in enthusiasm except the cheers that followed it.

Everybody appeared to understand the significance of the moment, and the practical appreciation of it shown would be worthy of the opening day. The motion of the engine was astonishingly noiseless, nothing being heard above a uniform murmur, resembling the well known sound of a well set wheel in rapid revolution. There were but 14 pounds of steam generated by the four boilers, and the revolutions of the fly wheel at starting numbered 15 per minute. The shafting cog-wheels, portions of which rise above the floor in distant parts of the building, though revolving with great rapidity, were even more noiseless than their gigantic motor. It was long before the spectators could turn away from the grand sight, and when they did it was to speak in admiration of that power in man which can invent the means of accomplishing the power of many giants with none of the bustle made by one child.

A New Telegraphic Machine.

The New York Post describes a new telegraphic machine invented by J. B. Fuller, and now on exhibition in that city, as follows: It is worked not by the battery power, but by a small steam engine, and constructed to operate either the Edison automatic or the Morse system. By the Edison system, 1,500 words a minute have been sent 50 miles, 1,200 words a minute to Philadelphia, and 800 words a minute 800 miles. The defects inherent in the magneto-electric machines heretofore in general use are, first, that their electric waves are given off in short disconnected discharges; secondly, that in heavy storms their batteries sometimes refuse to work; and thirdly, that the force of machines large enough to operate hundreds of lines of various lengths cannot conveniently be so controlled as evenly to operate only a single line. In the Fuller machine these defects do not appear. It not only lengthens the waves, but also laps them one over another in such a manner as to produce one uniform continuous current. It in no degree sympathizes with immoderate rain, wind or snow. And it possesses self-control sufficient to send a message with equal ease and clearness over a short distance as over a long one—over a single line as over many lines. In order to augment the electric force of the machine it is necessary only to increase the number of the magnets and the motive power of the steam engine. A machine capable of working 50 lines of telegraph wires can be run by a Baxter engine of four horse power, consuming not more than six scuttles of coal a day; and it may be placed either in the operating office or, if more desirable, a score of miles away, where it can be run by the water power of a stream, instead of by steam power. Electricians and capitalists who have been watching experiments made during the last few months are much interested in the results. The apparatus will soon be removed to the Western Union telegraph building on Broadway, in order to operate the instruments of the Gold and Stock telegraph company, which are said to require the largest amount of battery power ever used anywhere.

A Novel Piece of Mechanism.

Mr. Andrew Gendron, of Detroit, is, after nearly a year of constant labor, about completing a complicated piece of mechanism intended to represent the "Resurrection of General Washington," and which it is his intention to exhibit at the Centennial exposition. The whole apparatus is inclosed in a cabinet nine feet high, three and one-half feet broad and two and one-half feet deep. The lower half contains the machinery, and in the upper portion the diorama is displayed. The scene is a facsimile of the tomb of Washington. Upon one side stands an American and on the other a French soldier of the present day, while at the side end upon the recess beyond are painted allegorical figures and emblems. The machinery, which is quite complicated, is operated by a spring similar to those used in a clock. When it is set in motion a miniature cannon is fired, a bell is tolled, and a curtain, suspended across the face of the recess of the cabinet, rises slowly, bringing to view the tomb and sentinel soldiers. The latter stand at "an order." In the course of a minute or two the tomb opens, and a facsimile of the Father of his Country arises therefrom. Simultaneously, the soldiers face toward the tomb and present arms, and Washington performs the usual military evolutions. Then there descends from the clouds an American eagle, holding in its talons a staff, on one end of which is an American flag, and upon the other the national emblem of France, carrying in its beak a laurel wreath, with which it crowns the resurrected Washington. The machinery continues to revolve, and the scene is reversed and repeated as often as desired, each representation requiring about three minutes. The figures are made upon a scale of about three inches to the foot. The heads are carved by Mr. Julius Melcher, and the bodies are minutely correct and properly proportioned. The guns carried by the soldiers are in exact imitation of Springfield rifles, and the costume of the soldiers is patterned after the uniforms of the armies of this country and France. The dress of Washington is the same in color and style as that worn by him at the battle of Trenton. The construction of this curious piece of mechanism has brought out a great deal of ingenuity, and, as can be readily surmised, embodies a great amount of fine skill and workmanship. —*Detroit Evening Bulletin.*

TASTE IN PAINTING MACHINERY.—The *Cabinet Maker* some time since published an article upon the gaudy manner in which machinery is too often painted; it is too often drenched with the most glaring and ill-contrasted colors, that disgust the sight and mar the appearance of the machine. The following remarks will assist our readers to a better comprehension of what we mean, and also to select proper artistic contrasts: We have seen machinery in which bright, gaudy reds and scarlets mingled with bright blues and yellows in the most extraordinary way. A very little consideration will show that such combinations are breaches of the laws of harmony, which require that one color shall be subservient to the other, so as to perfectly blend the whole to an even and pleasing tone. Thus, the complementaries of red are green; of blue, orange; of yellow, violet. Precise rules, however, cannot be laid down, and much depends upon artistic effect to be decided by the eye. The following suggestions as to contrasts, however, may be found of assistance: (1) Black and warm brown; (2) violet and pale green; (3) violet and light rose color; (4) deep blue and golden brown; (5) chocolate and bright blue; (6) deep red and gray; (7) maroon and warm green; (8) deep blue and pink; (9) chocolate and pea green; (10) maroon and deep blue; (11) claret and buff; (12) black and warm green; (13) slate color with nearly all bright colors, excepting blues; (14) buff and black; (15) buff and blue or mauve, and so on.

AMERICAN RAILWAY CONSTRUCTION.—During 1875 the greatest mileage in any one State of America was built in New York, 200 miles having been added. California came next with 174½ miles; Illinois third, with 172 miles; Pennsylvania fourth, with 118 miles; Colorado fifth, with 113½ miles; Indiana sixth, with 109½. In none of the other states was an aggregate of 100 miles reached. The following States and Territories built none: Alabama, Alaska, Arizona, Dakota, Florida, Idaho, Indian Territory, Kansas, Kentucky, Louisiana, Minnesota, Mississippi, Montana, New Mexico, Oregon, Rhode Island, Tennessee, Virginia, District of Columbia, West Virginia, and Wyoming. Comparing the figures (1,483 for 1875 with the 2,449 miles of 1867, 2,979 miles of 1868, 5,118 miles of 1869, 5,525 miles of 1870, and 7,779 miles in 1871, it is easy to see the effect of the panic and the subsequent hard times upon American progress in the development of internal transportation facilities, and also to understand how it is that the iron trade, at one time enormously stimulated to meet the requirements of railroad construction, now languishes because the consumption on account of new rails alone, to say nothing of equipment, is reduced to about one-fifth of that of 1872, and because, to supply this, the special industry of steel rail manufacture calls for special grades of pig metal.

A PHILADELPHIA firm has manufactured for exhibition a large cast iron chain of 38 links, to represent the 38 States.

SCIENTIFIC PROGRESS.

Coal Dust for Fuel.

We have made former mention of efforts to utilize coal dust as fuel. We now find in our exchanges for the week two interesting paragraphs claiming success in this direction. First we take from the Harrisburg (Pa.) *Chronicle*, the following:

The problem of the utilization of coal dust seems to be in a fair way of solution. The trouble has always been that it would not burn because it was too compact and would rather smolder than ignite. For 50 years that has been the one great impediment, and scientists could not overcome it. Finally, however, Superintendent Wooten, of the Reading railroad, thought of introducing a steam blast through the coal from the bottom, in the hope of penetrating the mass and supplying plenty of air. He built a furnace specially for it and placed it under a stationary engine boiler. Instead of using grate bars he employed a perforated iron plate for the fire to rest upon. A pipe from the boiler conveyed the steam end the necessary pressure supplied the blast, and this stroke proved to be the keynote of the entire dirt problem. It burned freely and threw out an immense heat. The oldest dirt was used to see if it possessed burning qualities, and it was found that it consumed freely, the same as the best of coal. It was next tried in the furnace of a locomotive engine and was found to burn equally well. The other day, when the wind was blowing at the velocity of 40 miles an hour, a coal dirt burning engine took up a train of 100 cars through the valley with the same ease and with as little labor as an engine burning the very best anthracite coal. This is regarded as a great revolution in the coal and iron country, because it transforms at least 1,000,000 tons of heretofore useless coal dirt into a fuel worth, at the very least, \$1 per ton, and provides a way to consume all coal dirt that may come to the surface in the future.

A Compressed Fuel.

The experiments of E. F. L'Oiseau have been mentioned previously. There are, however, new works and new machinery which are very interesting. The New York *Tribune* describes the new establishment at Port Richmond, Pa., as follows:

The new fuel is composed of 95 per cent. of coal dust and five per cent. of clay, with a small amount of a glue-like mixture made of rye flour and slaked lime. It is in pieces of the shape and size of hens' eggs. To make the pieces impervious to water they are dipped in a solution of "candle gum," a residuum of paraffine and crude benzine. All the manufacturing processes are novel and ingenious. The clay is dried in an oven on sheet iron plates, the fire being in an iron car running on a track, so that it can be pushed forward or backward under the plates. Then the clay is hoisted up to an upper story, pulverized in a mill and deposited in a wooden receptacle. Close at hand is an iron boiler, eight feet in diameter and eight feet high, in which the paste is cooked by steam and stirred by revolving paddles. The paste is of the consistency of thick cream and escapes by a pipe at the bottom of the churn. The coal dust is drawn up on an inclined plane in small cars and thrown upon an oscillating wire screen, which takes out all pieces of slate or small chunks of coal. As the dust falls through it is carried in an endless chain bucket elevator to a bin holding five tons. Now the dust and the clay fall down into a curious little machine that measures out just the proper proportion of each and throws both ingredients of the future fuel into a common receptacle. But while they are dropping into this receptacle they receive a sprinkling of the liquid paste from perforations in an iron pipe. Another chain elevator takes the commingled ingredients up and deposits them in a huge iron churn holding six tons, in which are seven revolving shafts that swing their great toothed arms about in opposite directions and thoroughly mix the black grist. The substance now is of the consistency of moist sand. It falls upon a leather band and is carried to the hopper of the pressing machine. This consists of two iron cylinders 30 inches in diameter and the necessary apparatus to revolve them. The cylinders are each indented with 870 large molds and 56 small ones, and as the molds on the two come together they press the soft mixture into shape and afterward drop the egg-like chunks upon a moving wire-cloth belt below. The larger pieces weigh 2½ ounces each and the smaller ones half an ounce. Thus far the operation has been wholly automatic, and so it continues to the end. The egg coals, as they might well be called, must now be dried. They are dropped upon another wire belt that carries them into a great oven heated to a temperature of 250 degrees, and fall successively upon still other belts traveling in opposite directions, until they have gone the length of the oven five times. When they come out they are ready for burning, but must be "water proofed" to protect them from dissolution if caught in a rain storm. For this purpose another traveling wire belt, across which there are upright partitions of wire, catches them and gives them a bath of two seconds in an iron tank containing a solution of candle gum and benzine. The tank is inclosed to prevent the escape of the fumes. From the tank the coals go to a big bin called the evaporator, which holds 15 tons. The benzine fumes rise

through pipes to a condensing coil and the recovered liquid is conducted back into the tank from which it ran into the bath. After remaining about an hour in the evaporator the coals fall upon another moving belt, which deposits them in the final receptacle—the "pocket"—from whence they roll into the coal carts.

From the time the clay went into the mill and the coal dust was emptied on the separating screen the material has traveled a distance of 743 feet without being once handled. In the succession of ingenious automatic processes lies the secret of cheap manufacture. The factory will produce 150 tons a day with one set of machinery, and the product will be sold for \$1 a ton less than the price of stove coal.

Subterranean Telegraphy.

In a communication to a Continental contemporary, Niemeyer, sub-director of the royal telegraph station of Amsterdam, observes that the disadvantages inherent in the overland telegraph lines are more or less known, their inefficiency under unfavorable meteorological influences, such as in foggy or stormy weather; then their possible destruction, by trains running over the line, or other mechanical causes; all these causes have tended to occasion interruptions in the transmission of telegrams, often at a time when velocity of transmission was urgently demanded. Although, he continues, the pernicious effect of meteorological influences working against the speedy transmission of telegrams had already received attention at the time when electric telegraphy was introduced, still the subterranean lines then had to be abandoned on account of their imperfect isolation and the overland method was adopted in their stead. Notwithstanding that improvements in the isolation of subterranean wires were being constantly applied with perfect success, owing to the cheapness of first cost and superior convenience for repairs, the system of overland wires has been generally preferred and been very largely developed of late years, with, however, the result of almost daily interruptions. The cost of maintenance and repairs becomes thus much enhanced, although, after all, the overland system is, even now, as expensive as the subterranean system. With special reference, however, to the uncertainty of telegraphic transmission, the overland telegraph certainly does not always fulfill its functions, consequently, at the establishment of a sure and speedy means of communication is what we desire to obtain with the telegraph, the cost of its construction ought to be of secondary importance when compared to its ultimate object. Now, with an improved subterranean system these annoying delays might be obviated. The credit of having first looked at the proper side of the question at issue and treated it with the attention due to its importance is claimed by the North German telegraph administration. Six years have elapsed since this was done, and the plan that was then proposed is now to be carried out in Germany, inasmuch as a subterranean line between Berlin and Halle on the Saale has been commenced.

A CHINESE SCIENTIFIC JOURNAL.—There lies before us, says the *Scientific American*, a very curious periodical. It is a pamphlet of about 30 pages, stitched with green silk in covers of the brightest yellow. On the back, or rather the front, for the book is read backwards, there is a strip of red pink paper, covered with hieroglyphics. The pages are each double, that is to say, instead of the print appearing on each side of the sheet, it is impressed on one side, the sheet is folded, and the free ends bound upwards, so that the edge of every leaf is a fold. The paper is of that soft India variety used here for engravers' first proofs. Finally, the characters are all Chinese and printed in vertical lines. Such is the appearance of the first Chinese scientific journal, the *Chinese Scientific Magazine*. The editor, Mr. John Fryer, tells us, in his prospectus, that the journal is to "serve as an introduction to the translation of scientific books already existing in Chinese; it will contain notes or lectures on scientific subjects," and in brief is intended to disseminate useful scientific and practical information throughout the country.

ELECTRICITY AS AN AID TO EGG HATCHING.—The *Oestrheinische Landwirtschaftliche Wochenblätter* states that Dr. Virson, superintendent of the Italian experimental silk farm, at Padua, has discovered that the hatching of silkworm eggs, of suitable age, may be accelerated by a period of 10 or 12 days, and a yield of at least 40 per cent. of silkworm caterpillars secured, by exposing the eggs to a current of negative electricity from a Holtz machine for a space of eight or 10 minutes. It is suggested that the same method might perhaps prove useful in promoting the hatching of hens' eggs and in hastening the germination of various seeds. —*Quarterly Journal of Science.*

JUPITER'S SPOTS.—Flammarion publishes some interesting observations of Jupiter, made in 1874 and 1875, and sums up his work substantially as follows: These observations fix the principal aspects of the planet during these periods of opposition. They show that the visible surface of this globe is very changeable, but that, nevertheless, some of the spots persist for entire weeks; that these spots are accompanied by shadows, diffuse and nebulous; that the shadows of the satellites are sometimes gray and sometimes black; and that the tints of different portions of the planet not only differ from each other, but change in tone and intensity from time to time.

Compositions of Ancient Style and Date.

Mr. Wm. S. Moses, of San Francisco, has furnished us the following primitive and quaint but "fair square" Centennial documents, executed, respectively, in 1769 and 1735, "the said" Ben and Tom Phelps being ancestors of our friend Moses, who proves his true Yankee type by various ingenious inventions, one of which is an improvement in tilting drawers, for which he has recently secured letters patent through the MINING AND SCIENTIFIC PRESS Patent Agency. Mr. Moses followed his father in wood working, but he informs us that their ancestors were blacksmiths. The enl mentioned in the SCIENTIFIC PRESS last week as being sent to the Centennial was "brought over" from England in 1733 by John Moses, the great-grandfather of William.

[NEED OF A MINERAL BEARING FARM.]

Know all men by these presents that I, Benjamin Phelps of Simsbury in the County of Hartford and Colony of Connecticut, for a valuable sum of money, viz. ten pounds lawful money to me in hand paid received by my full satisfaction of Thomas Phelps of Simsbury do hereby release and release and farm let unto him the said Thomas Phelps and to his heirs, assigns, for, and during the full term of nine hundred and ninety nine years next ensuing, the one half of all the mines, minerals, metates, and oars of metates of what nature, kind or quality whatsoever, that or shall at any time hereafter during said term be found in any part or parcels, of the lands which I have ever bought of him the said Thomas, in the bounds of Simsbury in the West Simsbury Society, with full liberty for him the said Thomas, his heirs or assigns, at any time, or times during said term, to enter upon the premises, to dig, search for, sink shafts, work and separate any such oars or metates and with teams and carriages to carry away, all such oar, or metates, and oars of metates and of the said shafts and to raise on said land, (only reserving to myself heirs & assigns at my own cost & labour, to carry on the one half of the business of raising oars, &c., as aforesaid for my & their own profit & use. To have and to hold the said released and released premises with the appurtenances thereof unto him the said Thomas Phelps his heirs & assigns with-out let suit claim hindrance or molestation from the said Benjamin Phelps my heirs executors or administrators, or any other person or persons from by or under me, in witness whereof I have hereunto set my hand and seal the 24th day of April, 1769.

Signed sealed and delivered in presence of JOSIAH CASE, ABRAHAM CASE.

[A "STERLING" BILL OF SALE.]

Windsor givly 22d 1735 then received thomas phelps of windsor the sum of three shillings money it being in full of all debts bills bonds or any other accounts whatsoever betwixt the sd phelps and allin from the beginning of the world to this day as witness my hand

ALEXA ALLIN.

New Incorporations.

The following companies have filed certificates of incorporation in the County Clerk's office at San Francisco:

CONCORDIA G. & S. M. Co.—May 1st. Location: Virginia district, Nevada. Capital stock, \$15,000, in 150,000 shares of \$100. Directors—L. Lettewer, Wm. Hindoff, H. W. Jangeman, L. F. Holtz and A. Selbach. BRETHERTON G. & S. M. Co.—May 1st. Location: Virginia district. Capital stock, \$15,000, in 150,000 shares of \$100. Directors—L. Lettewer, Wm. Hindoff, H. W. Jangeman, L. F. Holtz and A. Selbach.

CALIFORNIA FURNITURE SPRING MFG. Co.—May 1st. Object: To manufacture and sell bed and furniture springs. Capital stock, \$50,000, in 500 shares of \$100 each. Directors—James Eaton, Amos S. Water, Wm. A. Crawford, C. B. Spalding and James English.

NEW ERA G. & S. M. Co.—May 3d. Location, Alpine county, California. Capital stock, \$10,000, in 100,000 shares of \$100 each. Directors—E. A. Hatherton, P. Amiraux, C. Wittman, W. A. Beal, E. F. Russell, G. W. Bowie and C. M. Grant.

SAN FRANCISCO AND CALIFORNIA M. Co.—May 3d. Location: Liguria, Chile. Capital stock, \$1,000,000, in 20,000 shares of \$50 each. Directors—W. B. Ewer, W. B. Quinby, W. H. Murray, A. H. Evans and Arthur P. Buros.

MOLLE STARK S. M. Co.—May 3d. Object: To mine and mill and to do a general mining business. Capital stock, \$10,000, in 100,000 shares of \$100 each. Directors—Wm. H. Gray, L. Van Schaick, H. P. Klus, A. F. Sturt and V. N. Putnam.

LAKNERCHUBB G. M. Co.—May 3d. Location: California. Capital stock, \$5,000,000, in 55,000 shares of \$100 each. Directors—J. James Laedrich, John C. Laedrich, Wm. Kulberg, Isaac B. Crocker and Nathaniel Hunter.

ANOTHER WIRE RAILROAD.—At the last session of the Board of Supervisors there was passed to print a grant of a franchise to construct the California Street wire cable railroad, to commence at Montgomery street and extend as far as First avenue. The movers of the project are Leland Stanford, Merck Hopkins, David Porter, Isaac Wormser, P. H. Canavan, E. B. Pond, Robert M. Graves, John H. Redington, Michael Reese, Louis Sloss, B. Adolph Becker, Charles Crocker, D. D. Colton and others. In the event of no unexpected obstacles being encountered, the promoters promise that work shall be commenced within six months, and the road completed within two years thereafter. All the owners of property along the route who have been consulted on the subject are claimed to be in favor of the project, and ready to contribute substantial aid.

A PARTY of Black hills miners just returned to Sioux City say there is no fodder for cattle or horses in that country, and that stock is dying off rapidly from starvation. The grass is not yet started, and in many places snow still covers the ground—to the depth of a foot in the vicinity of Custer City. This party counted the carcasses of four hundred animals that had recently died of disease and starvation.

ENWARRN BARNON has resigned as President of the Consolidated Virginia mining company, and C. H. Fish, formerly Secretary, has been elected to fill the vacancy. A. W. Havens has been appointed as Secretary.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

California.

AMADOR. TO BE STARTED UP.—Amador Ledger, April 27: It is rumored that the Mahoney mine, of Sutter Creek, will be started up at no distant date. The mine has been idle now for more than a year. Contradictory reports are about as to the quality and quantity of the ore-body met with in this property. It is claimed by many that the mine is a paying one, and that its suspension was a dodge on the part of some of the shareholders to get the property into their own hands. At any rate we hope to report of a speedy resumption of work may prove true. It is just what Sutter Creek needs at this juncture.

INCREASE OF STAMPS.—The Phoenix mining company of Plymouth have decided to increase the capacity of their mill by the addition of at least 20 stamps during the summer. The machinery of the mill is capable of running 60 at 40 stamps. The Phoenix is evidently entering upon a prosperous era. There is some talk of working the Alpine mine, which belongs to the same company, and adjoining the Phoenix works, by running drifts from the Phoenix. Plymouth is as lively a camp as there is in the county, and several buildings, we hear, are in course of construction.

THE GOVERN MINE.—Amador Dispatch, April 21: This mine, which is located near Amador City, and superintended by John Phelps, was last week still yielding handsomely. They make a "clean up" every two weeks, and the average yield is about \$9,000 per month, besides the sulphurates, which afford an additional yield of from \$2,000 to \$3,000 per month. The shaft is now down about 700 feet, and good paying rock is found in all parts of the mine.

THE YERDA MINE.—We are informed that the Onelid mine now taking out and crushing a very superior quality of rock. It is now running 40 stamps by water power, which it gets from the Amador canal.

CALAVERAS.

A BONANZA.—Colnverra Chronicle, April 29: We learn that rock of incredible richness continues to be taken from the Grasshopper mine at Mosquito. Parties who have visited this rich mine inform us that the ore being taken out absolutely glitters with free gold. It will yield thousands of dollars per ton. The ledge widens as operations progress, its average thickness at the present depth—100 feet—being 18 inches. There are about 15 tons of ore now in the dumps, and more is being daily added to it from the 100-ft south level, all of which is rich. When the Grasshopper ore is crushed, we expect to be able to chronicle the largest average yield per ton ever recorded in the State.

SINKING.—The work of sinking the San Bruno shaft, at Mosquito, has been commenced and good progress is being made. A strong force is employed.

COLUSA.

RICH BONANZA.—Colusa Independent, April 29: The Abbott quicksilver mine is turning out some of the finest ore that has ever been taken from the bowels of Mother Earth. The controlling interest in this valuable mine is owned by Jackson Hart and W. F. Goad, of this place. It seems that the faster the miners penetrate into the earth, the richer the ore becomes, and they will not have to go much farther, at present indications, to reach the pure metal. We have examined another specimen from the Abbott this week, that is as near pure quicksilver as ore can be expected to become. This specimen is about the size of a common brick, and weighs between 14 and 15 pounds. It is a beauty, and will go to the Colnverra or beyond of the ore men. The fortunate owners of this mine feel jubilant over their prospects.

EL DORADO.

RICH.—El Dorado Republican, April 27: We learn that A. J. H. is making a rich investment among the mountains of the old Jack Johnson meadow. He has already taken out several thousand dollars in beautiful coarse gold, and we are told by parties who ought to be able to judge, that if they had the claim they would not give ten cents to be insured \$50,000 for the season's work there.

INYO.

DEFIANCE MINE.—Inyo Mining News, April 29: Our trip to the gold ledges and Lookout last week precluded a report of this mine, which continues to improve with every day's development. By permission of P. Reddy, Esq., the superintendent, we made a visit to the mine on Wednesday, and through the courtesy of Mr. S. Hubbell, the very competent foreman, we inspected the latest developments. In the north surface workings the winze is down 30 feet, the ledge at this depth being 28 to 30 feet in width, with ore from top to bottom, although an occasional boulder is met with, but the ledge is well determined. In the raise from the main tunnel a magnificent body of ore has been encountered in the upper workings, and as the same body is found in the lower workings, there is no doubt but that it extends clear through. Since our last visit a drift has been started near the hoisting works, running northward, and is now in 75 feet. This drift is intended to strike the ore body north, which is immense. The winze from the main tunnel west, some 300 feet from the south, is now down 25 feet, all the way through ledge matter, with occasional bunches of good ore, the last indications and ledge matter raised therefrom showing that a large body of ore will be struck within a few feet. The two adopes from the south winze, running north, are looking splendidly, large amounts of fine ore being extracted. The other parts of the mine are in good shape. The hoisting works are all completed, and the work on the shaft will be commenced immediately. The boiler, engine and other machinery are now on the ground.

DEFIANCE FURNACE.—The leak in the water-jacket, of which we spoke last week, finally became so serious on Monday last that the furnace was shut down to await the arrival of the new jacket. It arrived yesterday, and Mr. Shepard, the furnace superintendent, is busily engaged in putting it in position.

VETERAN.—This mine was located by Captain D. B. Akey, and is the first extension of the Confince mine, belonging to the Modgo Consolidated mining company, and is being opened by a tunnel at the foot of the mountain at a point where the ore body has been encountered in being run in directly on the ledge which crosses the mountain at a right angle, the Confidence, Eclipse, Kentucky and Minietta claims being on the same ledge, which runs directly through the hill, as is seen by the hold croppings, which are traceable for at least 6,000 feet. The tunnel on the Veteran is in some 15 feet, is about seven feet in width, with ore on all its sides, and the face, the ore being exactly the same as that found in the Confidence. This is a good evidence that the ore body goes down to a depth of at least 1,000 feet, as the Minietta, which is similarly situated, had on the opposite or south side of the hill, has also similar ore.

LAKE.

GREAT EASTERN MINE.—Lake County Bee, April 27: A short visit to the Great Eastern mine last week enables us to report all alive. Movements being inaugurated by Superintendent Craven are looking toward the erection of a furnace of more adequate capacity than the one now in use. We found a very superior quality of ore on the dumps, and the miners report the recent discovery of a large body of metal of uncommon richness. This mine is most conveniently located on the Calistoga and Middletown road; the main shaft not

being over 200 feet from that thoroughfare. The Great Western mine will put up several fine ore furnaces the coming season. The construction of these, should they prove as practicable as expected, will materially reduce the cost of the reduction of fine ores at this mine.

NEW MINES.—Vallejo Chronicle, April 29: Mr. George Montgomery, the discoverer of the new gold and silver bearing rock in Lake county, was in town Thursday, and from him we learn some particulars. The ledge is found about seven miles north of Middletown, in a region thickly covered with brush, and can be traced two miles and a half. It is from 10 to 15 feet wide, as shown in the places where it crosses ravines. Particles of gold can be distinctly seen in the rock by the naked eye, and it contains both gold and silver, and is said to somewhat resemble Crown Point rock. No regular assay has yet been made, but Mr. Montgomery went down to San Francisco to-day with specimens to have one made. Montgomery is, we believe, an old prospector, but this ledge he came upon quite accidentally, having been in the region only two days. Besides his claim, as many as 20 others have been taken up, and a great deal of excitement reigned in that section when he left. James Haley is one of the holders of claims. It is expected some San Francisco parties will be interested in a company to work the ledge, although no details have yet been arranged.

MARIPOSA.

MINING ITEMS.—Mariposa Gazette, April 29: We learn that Messrs. Tiffany & Hepburn, who have bonded the Blue Lead and Scanlan quartz mines, above Coulterville, in this county, are progressing rapidly with their work in erecting buildings and machinery upon them, with a view to thoroughly prospect, and ascertain their richness in the precious ore, which they are known to contain in greater or less quantities. On the Blue Lead they are sinking a new shaft, and preparing to construct hoisting works, the machinery for which is on its way up from San Francisco to that locality. On the Scanlan mine, they expect to run the tunnel by means of a Burleigh drill, with a compressed air power, by means of which the wealth of this mine can soon be ascertained.

EXTRAORDINARY.—Messrs. Lamb & Adams have struck a rich lead of gold bearing quartz rock, about one-fourth of a mile in an easterly direction from the Blue Lead and works of Messrs. Tiffany & Hepburn, which is supposed to be a continuation of the same vein. This vein is about 15 inches thick, and prospects from \$80 to \$100 per ton.

FERROUS MINE.—The Ferguson mine, situated on the main Mariposa river, which formerly yielded its thousands of dollars in gold, but by some mismanagement has been allowed to remain idle for some years past, has been purchased by Mr. Ferguson, one of the original proprietors, who is about to resume work on it.

MAXWELL'S CREEK GOLD MINING COMPANY.—These works, situated near Coulterville, are progressing finely. They have quite a number of men employed getting out ore, cutting wood, and repairing roads, and will soon commence crushing. There are two veins, which are known respectively as the "Potosi" and "Mary Harrison." Rich ore has recently been struck in the latter, which, together with that already taken from the Potosi mine, gives assurance of a golden harvest to the company.

NAPA.

CONSOLIDATION.—St. Helena Star, April 29: From Mr. Daniel Patten, Superintendent of the Phoenix, who went to the city Monday, we learn that the Phoenix, Washington and Red Hill mining companies, in the upper end of Pope valley, have consolidated under the name of the Pope Valley quicksilver mining company. The Board will organize next week, when the property of the old corporations will be conveyed to them for the new company. The Phoenix, it may be here remarked, has not yet sold its last run of quicksilver, but is keeping the amount—42,000 pounds—for a better price than at present prevails.

THE ERNA MINING COMPANY.—Napa Register, April 29: The new directors of the Erna mining company, which has recently been reorganized, have held a meeting since their recent examination of the property, and consulted as to what should be done with it. The future course of action has not been fully determined upon; but it was decided to sell the pumping apparatus at the Valley mine; and it is also contemplated to move the furnace from the Valley to the Silver Bow. The mine is the best mine of the three which were consolidated under the name of the Erna, and is supposed to be a good mine and susceptible of profitable development. Some \$40,000 or \$50,000 worth of ore were taken from it under the old management.

PLACER.

ECLIPSE MINE.—Placer Argus, April 29: We learn that the development of the Eclipse mine, near Ophir, is in full progress, and that there is every prospect of its turning out one of the best paying mines in the Ophir district. The air shaft, to connect with the main shaft at the 100-ft level, is down 75 feet and will soon connect. The ledge at the depth of 100 feet is four feet wide and is yielding ore plentifully, and about \$10 per ton. The ledge is richly mined and abundant there is no trouble in making it pay. The mine is under the superintendence of C. A. Cooper, Esq., and is regarded as one of the most promising in the county.

MINING ITEMS.—Dutch Flat Forum, April 29: The break in the ditch of the South Yuba canal company, mentioned in our last issue, was repaired last week and water passed again. The water was carried away from the break, carrying away portions of a high trestle work, and breaking the ditch of the Miners' ditch company, which at this point is situated below it on the same hillside. The break in the latter ditch was repaired and water running within 24 hours. The former, however, was a more serious affair and has not been repaired at the time of writing. Great damage has not been reached, but these leaks are much to be regretted, as now is the harvest time of the hydraulic miner. The Polar Star claim, the object of much interest at present, has not, we are informed, been able to wash but 22 hours during the past week, owing to the break in the ditch of the South Yuba canal company, mentioned above. The Summerett and Miami claims are both idle from the same cause. The Central claim closed up on the 19th, and the Pacific on the 20th inst. The returns from each being the largest for the season, considering the number of days washing. Both having been refitted, resumed washing yesterday. The Gold Run claim cleaned up on Saturday, yielding quite a satisfactory product. The Cedar and Indian Hill claims are washing. The claims are working rapidly down toward the bedrock, where the rich deposit lies. The Yankee continues washing, using water about 18 hours a day to good advantage. This has been a hard nut to crack thus far this season owing to the great overlying rock and clay slide which has been constantly moving down over the face of the gravel. But as the water is being used to preserve the face and energy, this has been so far removed that the claim is in a very promising condition, and may be expected to make a big showing the balance of the season. The Badger claim has been using water about five hours per day, washing down a cut. The bed-rock having been reached, powder drifts are now being run to more rapidly open the pit. This claim promises well this season. Everything is in full blast in the mines of Little York and Liberty Hill.

PLUMAS.

LA PORTE AND VICINITY.—Plumas National, April 27: Mr. S. S. Russell, of La Porte, arrived in town on Wednesday last, and gave us a call. He says the past winter in that section has "knocked the spots" off from everything ever before known to the oldest inhabitants, and although spring has arrived, the signs of winter are still plenty. The snow is six or seven feet deep in the streets of La Porte, but is fast settling down. It is hard and solid, and a man can travel on the crust at

most as well as on the ground. The water has started, and almost all the hydraulic claims are in full blast. Provisions are getting scarce, and there is not a sack of flour for sale in any of the stores of La Porte, Gibsonville or Howland Flat. Potatoes are being brought from below, and sold at six cents. The miners are calculating on the water lasting till August, and have high hopes of a successful season. Mr. J. M. Daughters is in charge of Conly & Gowell's claims, and Mr. Gowell is expected up at any time. The Citybank company are at work cleaning out the old tunnel to furnish better air.

SISKIYOU.

SOUTH FORK OF SALMON.—Yreka Union, April 15: We learn that the mining prospects of the South fork of Salmon river are looking up finely, and work is being resumed up and down this stream with renewed vigor. Several new diggings have been struck, which pay largely and give evidence that there is plenty of new ground in that locality that will pay rich if worked. Graham & Gosh have lately taken up a claim about two miles below Fairbald, and take out about three bunches of the ore. One bunch, which they took out of a head of water they took out \$130. The claim on what is known as the second bench. There is no doubt of a good pay stream running along this second bench. Lewis Friday & Co., on Methodist creek, are doing very well. This company have now got a ditch of water running on to their claim and will take out the dust in large quantities. Egbert, on Methodist creek, has got a hydraulic claim, and has just washed away the dirt. He has prospected and found the pay channel underneath and expects to shortly reach it with hydraulic. Boston & Co. have got a good claim on Graham gulch. They have got plenty of water now and can take out \$100 a week to the hand. Brookins & Lewis have struck a good spot on Indian bar, and are taking out extremely good prospects. The water is doing well, and everything in the present indicates a lively mining season on the South Fork this year. There is plenty of good ground in that locality yet, and all it wants is a little energy and perseverance in prospecting to find it.

WORK COMMENCED.—Work was resumed on the Norfolk quartz ledge at Coulterville on Monday last. This great difficulty this company has met with in the past has been the water, the ledge lying so flat that the greatest difficulty was experienced in keeping it clear of water so that the men could work. The company have now started to run a tunnel on the south side of the mountain, and it is expected that this will entirely drain the mine. Work will now be pushed vigorously forward. At the place where the new tunnel has been started the ledge is a foot and a half wide, the rock is streaked black and white, and prospects first-rate. The last rock taken from the ledge—about 100 tons—paid when crushed about \$23 per ton. The Lodi, on the opposite side of Rocky gulch from the Norfolk, is lying idle at present, but work will no doubt be resumed in an early day. The last work done on this ledge developed some very rich rock.

STRUCK A GOOD LENS.—We learn that the proprietors of the old Mooklunburg quartz ledge, Messrs. McCann, Isenbeck and Walters, have struck a three-foot ledge of excellent quartz in their mine, and will soon have enough out to start up the mill belonging to the company. This ledge and mill is on the middle fork of the Redding, and when worked will make much. The former proprietors ran a tunnel and sunk a shaft on what they thought was the ledge, but what they took to be the actual walls of the ledge was merely a false wall and one of the walls of the ledge proper. The new proprietors' breaking through what the former proprietors supposed to be the hanging wall of the ledge have found a ledge of excellent quartz three feet thick and they have every prospect of having an extremely good thing.

THE EVENING STAR.—We learn that the prospects of the above mine, in the Salmon section, are as promising as ever, and every four weeks the company's mill furnishes its full quota of billion to its proprietors. This mine is considered by men who know what they are talking about, as being one of the most valuable mines in the State. They have a big ledge of excellent rock which pays with the utmost regularity.

TULARE.

SALE OF MINING STOCK.—Visalia Delta, April 27: Most of the stock issued by the New England tunnel and smelting company to holders in Tulare county under date of April 13th in payment of delinquent assessment, a very considerable portion of this stock was issued in payment for labor on the company's mill. The nominal valuation of the stock when issued was \$3 per share, or a share for a day's labor, though the face of the stock is \$100 per share. Much of the best mining property of Mineral King mining district was purchased with it at a valuation of \$3 per share, and upon the stipulation that the stock was non-assessable. The supreme court has decided that all stock is assessable, and now an assessment of 10 cents on the share causes it to be sold. It would seem that when the company was organized, the law was not complied with in the matter of paying in the 10 per cent, and that no percentage whatever was paid for it. We hear, however, upon the latest news, that the stock is now assessable. The company is now taking in new stock, and the holders of the old stock, which is to come off May 2d, such men as Senator Stewart, Thompson, Richardson, Rosecrans, Morgan, Smith, Munshue and others figure largely. Several of these men are members of the San Francisco stock board. The recent assessment leaves the company with several thousands of dollars on hand, and it is hoped that a new set of officials will go on with the development of the company's mines.

TUOLUMNE.

TRUMBULL.—Near this locality is the Trumbull vein and mine, which was located by David Trumbull, many years ago, and has been tenaciously held on to by him during that time. Mr. Trumbull is an experienced miner, and is sanguine as to the richness of his mine, and expects to live to see it fairly developed and listed with other first-class mines of the county and State. Mr. Trumbull is the inventor of an improved arastra, which requires but a small capital to utilize, and would no doubt prove a success, and add materially to the facilities for grinding and amalgamating quartz rock, and save a greater percentage of rock than any other mode or process at this time in general use by which gold has been extracted from quartz rock since its discovery in California.

MARTIN & WALLING.—This is one of the oldest mines that has been worked in the county, and in years gone by was famous for its productiveness. It is now incorporated under the name of Martin & Walling mill and mining company. Since its incorporation they have added hoisting works, and have re-umbered the old shaft, which was about 140 feet deep to the tunnel formerly run by the original locators. Work on the mine was again resumed in March last, by continuing the main shaft down 110 feet, which makes the shaft 250 feet in depth. By running a level 35 feet from the bottom of the shaft, the old shaft was reached, which is about three feet thick, and will pay from \$60 to \$70 per ton. As soon as the level is completed the company will extract ore as fast as possible; at the same time a 10-stamp mill will be attached to the hoisting works, which are run by steam power.

Nevada.

WASHOE DISTRICT.

JUSTICE.—Gold Hill News, April 27: The drift south at the 800-ft level will come to a connection with the drift north from the bottom of the winze from the 600-ft level in about a week. The ore here and at the 400 and 600-ft levels are of the best quality and keeping the mill steadily running. Another mill will

be put in operation on the ore from these levels next month.

HALE & NORCROSS.—An immense excavation has been made and is being filled with stone for a foundation on which to place the heavy pumping machinery now arriving. The shaft has been placed in the best possible condition, and is now as straight and smooth from top to bottom as it is possible for such a piece of work to be. When this machinery is once in good running order the Hale & Norcross will be in a much better condition for good deep sinking than ever before.

IMPERIAL.—The face of the north drift on the 2000-ft level is still in rich ore. The drift is being steadily advanced toward the Alpha lode. A station has been opened in the south drift on the 1900-ft level, and a winze started to connect with a drift now being run in Confidence ground on the 1740-ft level of the Yellow Jacket.

BEST & BELCHER.—The connecting drift with the Gould & Curry on the 1700-ft level is being put in excellent repair.

CON. VIRGINIA.—Daily yield, 550 tons of ore. This is crushed at the mills as fast as extracted. The yield of bullion for April will reach somewhere between \$3,300,000 and \$2,600,000. The ore breasts were never looking better or the mine more prosperous than now. Had the company the necessary mills the yield could be easily doubled in a single month. Sinking the C. & O. shaft is making excellent progress, considering the great size of the excavation necessary and the large amount of water to drain as the work progresses. The average rate of sinking is nearly three feet per day. The pump is hoisting about 40 inches of water, but the bottom is now confined to within eight or ten feet of the top of the shaft, showing conclusively that the largest part of the body has already been drained.

CALIFORNIA.—On the 1400-ft level the north drift has been thoroughly retempered and is again being pressed steadily ahead to connect with the Ophir. This drift has yet about 100 feet to run to complete the connection. On the 1500-ft level the north drift is also being driven forward to make an air connection at that point with the Ophir. Sinking the winze below cross-cut No. 6, on the 1550-ft level, is making good headway.

OPHIR.—Daily yield, 150 tons of ore. This ore is being crushed at the mills and is yielding a very handsome profit. The requisite number of mills have been obtained and the mine is now in a position to produce regular monthly dividends in a very short time. The ore breasts on the 1600-ft level are looking splendid and promise a goodly yield for many months to come. The fourth compartment of the shaft is completed down to the 1465-ft level, and the lucille hoisting machinery is now in the best possible condition for driving the developments on the lower levels. This is a matter of great encouragement, as it was a positive necessity that this work should be accomplished before the development of the deep levels of the mine could be accomplished to any material advantage whatever. Now that it is done some good work may be looked for. Cleaning out and repairing the drifts on the 1700-ft level is making rapid progress. On the 1100-ft level the south drift is still in quartz and ore, and will soon have opened a considerable extent of ground, ready to open and cross-cut the ledge.

WARD.—The foundations for the steam boilers and other machinery are being pushed rapidly to completion. The south drift on the 1000-ft level of the Julia has been started up and is being pushed ahead to prospect the Ward ledge at that point. This is a very important move, as it will not only determine the value of the ledge, but the shaft can be sunk to that depth, will afford a means of ventilation.

YELLOW JACKET.—The north and south drifts from cross-cut No. 3 on the 1940-ft level are still being driven ahead on the ore formation—one penetrating northward and the other southward. Cross-cuts Nos. 1 and 2 on the 1940-ft level are being steadily pushed ahead to prospect the ore vein south of cross-cut No. 3. The prospect that the vein is about 100 feet from the faces of both these drifts is about as good as the mine. The east cross-cut in the Confidence ground on the 1740-ft level is in a mixture of quartz and porphyry.

SILVER HILL.—The north and south prospecting drifts on the 1500-ft level are steadily advancing with favorable indications each way. The prospecting drifts and cross-cuts on the 1250-ft level are without change of material interest. Sinking the winze below the 700-ft level of the shaft is in connection with the south drift on the 1250-ft level, is also making good progress.

NORTH CON. VIRGINIA.—Sinking the main shaft is going steadily forward, the bottom still in porphyry, mixed with white quartz of a very hopeful character. This quartz carries a large amount of pyrites of iron.

SENIOR.—The use of the new hoisting cable was commenced to-day. This gives much better facilities for hoisting. The shaft is nearly drained and sinking will be resumed in a day or two.

BULLION.—The black dyke and porphyry in the face of the northeast drift on the 2000-ft level is getting much softer and begins to show evident signs of soon giving place to ledge material. The north drift on the 1400-ft level is again being steadily advanced, the face in very favorable ground.

MEXICAN.—The north drift on the 1465-ft level is steadily advancing along the east clay wall of the ledge, still finding in its course streaks and spots of very favorable looking quartz and ore. Preparations are now being made to commence cross-cutting the ore vein at different points along this drift in a very short time. When this is done there is little doubt that some valuable developments will be made.

KNOCKBROCK.—Sinking the main shaft is making excellent progress, the bottom being in ground of a little softer character. Numerous and very promising streaks of quartz are being encountered in the bottom of the shaft, which seem to show larger and much more solid bodies in close proximity, which may be cut into almost any day. There is a slight increase of water.

UNION CON.—The quartz in the face of the north drift on the 1350-ft level is still showing favorably for a broader and better development of the ledge and ore formation going northward.

UTAH.—Sinking the main shaft is making the usual steady progress, the bottom still in ground of a character that not only admits of a fair rate of speed, but which is having the shaft run on one of the smoothest and best working shafts on the line of the Comstock. The flow of water is still strong.

AMAZON CON.—The main south drift on the 300-ft level has penetrated the ore vein a distance of 40 feet from the station, at which point the ledge is evidently widening, with very flattering indications of the development of ore in large bodies.

BELCHER.—Daily yield, 450 tons of ore, keeping the mill steadily running. The ore breasts are looking well and continue to afford an abundance of good milling ore. The erection of the new and powerful pumping machinery is going rapidly forward.

PROSPECT.—Ten feet has been added to the depth of the shaft since last regular report. The bottom is in favorable working ground. No increase of water.

LEVATHAN.—The shaft having passed through the ore vein, mentioned heretofore, a station is being opened at the 600-ft level for a drift into the ore body.

KOSUTH.—The opening up the 600-ft level is steadily progressing in the most favorable manner possible.

GLOBE CONSOLIDATED.—The machinery and works are now in the best possible condition for a steady prosecution of the development of the ledge.

LADY BRYAN.—The work of preparing for the erection of the new and powerful pumping machinery is going steadily forward. The excavations have been commenced.

SUPERIOR.—Shaft down 90 feet, with the bottom in very encouraging looking vein material. The water increases, slightly interfering with the progress of the work.

BALTIMORE AND AMERICAN FLAT.—The 1250-ft station is opened and a drift has been started to prospect the ledge at that point. The face of the south drift on the 1050-ft level is still in quartz of a favorable character.

NORTH CARBON.—The new machinery for the hoisting

works is being placed in working position as fast as possible, and will be ready to start up in a few days.

FLORIDA.—The new machinery works as well as could be desired, and the drift at the 300-ft level is getting into good working shape.

OVERMAN.—Sinking the main shaft is making fair progress. The flow of water is still great but is steadily drained by the pumps.

SAVAGE.—The foundations for the new pumping machinery are rapidly approaching completion, and the machinery is fast being erected.

CHOLLAR-POKOR.—Sinking the combination shaft is making excellent progress.

SILVER CITY.—The management of this mine having changed hands, different arrangements are being made for working it, of which we shall be able to speak more definitely hereafter.

TWIN PEAKS.—The fine ore vein found in the shaft improves as greater depth is attained, showing wider and giving better assays.

LADY WASHINGTON.—The material at the bottom of the shaft shows considerable improvement. The whole bottom is in vein matter of the most encouraging character. It gives low assays in gold and silver, and is evidently leading to something good. Water shows a slight increase, but the pump handles it with the most perfect ease.

JULIA.—The main southwest drift, on the 1600-ft level, is steadily advancing at the rate of four feet per day, the rock being much softer than for some time past. The south drift from this main drift is steadily advancing, the face in quartz and low grade ore of a very favorable description.

GLASGOW.—The north drift, on the 300-ft level, is now in a distance of 46 feet. The entire width of the vein cannot be determined until everything is in readiness to cross-cut. During the week this drift encountered a streak of white quartz and ore rich with sulphurets of silver. This streak is gradually widening.

COSMOPOLITAN.—The main tunnel or adit is being pushed ahead, following the ore vein northward. The face is in streaks of good ore and porphyry. It will be followed to the north line of the claim. The upraise above the tunnel is getting along pretty well toward the surface, being up nearly half-way. It is in very good ore, some streaks which give good assays.

DARTMOUTH.—Driving the south drift on the 300-ft level to connect with the Kosuth for ventilation purposes is making excellent progress.

MORNING STAR.—The water has been drained from the main incline, and the sinking is again making good progress.

SILVER HILL.—Sinking the shaft is making steady progress, the bottom in good black ground.

RED AND WHITE ORES.—Shaft being sunk at a very good rate of progress, with the bottom in quartz, clay and porphyry of the most encouraging description.

CALEDONIA.—The flow of water causes some trouble but does not check or impede the progress.

NEVADA.—Better streaks of ore are coming in at the face of the north drift, showing increasing indications of nearing the main ore chimney.

ORONAGO GOLD HILL.—The retempering of the shaft will soon be completed.

MINT.—Sinking the main shaft is going ahead with renewed vigor, the bottom in soft working ground.

TRONAN.—The buildings are finished and the new steam machinery is nearly ready to start up.

PHIL. SHEPARD.—Everything is in readiness to again resume the thorough development of the mine.

(Continued on Page 300.)

CONSOLIDATED VIRGINIA MILL.—Almost the entire machinery for the rebuilding of the fine 60-stamp mill, destroyed by the fire last October, is on the ground; and as soon as the heavy timbers necessary can be obtained from the mountains its erection will be pressed to completion with all possible vigor. A new and wise plan has been adopted in regard to its restoration. A large amalgamating mill, similar to that of the California, will be erected on the site of the old mill, but the battery mill, which it is intended to make an 80-stamp mill, will be erected just below the C. & C. shaft, so as to receive its supply of ore direct from the shaft without any cost of transportation whatever. When the battery and pan mill are each finished, by a simple change of sluices from the California battery mill to the new Consolidated amalgamating mill, it will be supplied with the crushed ore from the upper batteries and the California pan mill with ore from the lower batteries, the whole forming one of the best and most economical arrangements possible. At both the C. & C. shaft and the California mill, large excavations are being made to put in condensing cylinders of great power, which will add greatly to the utility and strength of the works. The foundations are also being laid at the C. & C. shaft for six compressors of the largest and best patterns.

THE BONANZA.—Here is what the Gold Hill News says of the California mine in its latest "Mining Summary": Daily yield, 250 tons of ore, keeping the mill steadily running. The crushing of this ore is now adding from \$50,000 to \$60,000 worth of bullion per day to the product of the Comstock. The total product of bullion for April, with this one mill alone, will be over \$1,600,000, if it does not reach \$1,700,000. As for the richness of the ore these figures speak for themselves and need no explanation from us. The mine is just beginning to be opened, and, to confine ourselves to the simple truth, the only drawback yet experienced in its workings is to find ore of a sufficiently poor character to mix with the richer ore to keep the grade of the ore down to a sufficiently poor standard to amalgamate well. If there are any who have the temerity to doubt the truth of this assertion, we hold ourselves ready to substantiate every word of what we say. It will be seen that the California can easily make a dividend in May if the managers so desire. Whether they will or not is yet a matter of speculation, as those matters are decided by the board of trustees in San Francisco, and they have at least 10 days yet in which to deliberate as to what course they will pursue.

GOODMAN & Co. have purchased three acres of land at Mark West, lying adjacent to the railroad, and intend starting a large manufactory of wagons, carriages and agricultural implements.

WORK is progressing fairly on the narrow gauge between Nevada City and Grass Valley. The work will be completed on the 15th of May.

Mining Improvements in Oregon.

The unusually favorable mining season with which we have been blessed, says the Oregon *Sentinel*, has stimulated private enterprise to an extent that promises future good results, and will terminate, undoubtedly, in at least a partial restoration of the camp. So many years of drouth in succession served to deplete effort in prospecting, as well as to deter capital from undertaking new enterprises which would otherwise have been brought to completion long ago. But as we have said, new life has been infused into the camp, partially by the favorable season, and partially by example afforded in the introduction of improved methods of working placer ground.

A large extent of rich ground has for many years been known to exist in various localities near this place, but until lately has been considered unavailable by reason of the supposed great difficulty in procuring water and the impossibility of obtaining sufficient "dump," farmers, of course, being unwilling to have their ranches destroyed or damaged by the vast bodies of "tailings" which would have been deposited upon them by the old method of hydraulic. But these obstacles have to a great extent disappeared as improved methods have been introduced. A few days ago, J. S. Howard, surveyor, and a party of assistants made a preliminary survey of a ditch line between the headwaters of Applegate and the rich but supposed unavailable camp of Sterling, a few miles southward from this place. They not only found the line entirely feasible, but also discovered that sufficient water for a good sized canal could be procured from Applegate and brought to Sterling with a fall of 250 to 450 feet on the highest ground in that camp. From one fork of Applegate (known as Little Applegate) there can at this time be procured 2,500 inches of water, and by extending the ditch a short distance further that much or more water could be procured at all seasons of the year, which by reserving in the dry season could be made to answer for working the whole camp the entire year. The question of "dump" has never interfered there, as there is a fall into main Applegate of at least 150 feet, with a volume of water in that stream sufficient at all times to keep the dump clear. The proposed ditch is, between the mines and where water is first reached, twenty-two and three-quarter miles. This procures 2,500 inches at this time, and by a short extension, to another fork, takes in as much or more than double that amount.

We are informed that this preliminary survey was made at the instance of parties fully able to construct the work, and now that its feasibility is demonstrated there remains nothing to be done but to arrange preliminaries for a commencement of the work. Besides this, the construction of the proposed ditch will render available for grazing land, on the tops of bald mountains which has hitherto been useless by reason of a scarcity of water.

On Monday morning last the same gentleman and a corps of assistants began the work of final survey on a ditch proposed by John Orth, which will take water from Griffin creek and be of eight or nine miles in length. The size of the ditch has not yet been determined upon, but will be constructed so as to carry all the water that can be taken from the stream as well as the smaller brooks in the line of its transit. This will afford water for the working of probably a greater extent of ground than the Applegate ditch, much of which is known to be very rich. It will be intended to work that famous tract known as "Johnny Orth's pasture," which of itself embraces area sufficient to last many years, and which has been prospected to a depth of 80 to 100 feet, with good pay the entire depth and the bedrock yet untouched. This tract lies in the line of the "old channel" which runs through these mountains from east to west, and from which doubtless came all, or nearly all, the gold found in the various rich creeks and gulches about here, all of which rise in or cut through this channel from Galice and Briggs' creeks in Josephine county to the Klamath river in California. It has been worked in the low places, while the high mountains over which it passes, and even many lesser elevations, have been untouched from want of water. These ditches will furnish water to work ground thousands of feet higher than has heretofore been touched. On the high mountain west of town, more than a thousand feet above running water, Jos. Blatt has been mining for many years by drawing water from a well and rocking, making fair wages all the time, we are informed, while as high as 75 cents have been obtained to a flour sack of dirt taken from shafts sunk in Orth's pasture. Old prospectors say they know of many small tracts of ground on the line of Orth & Co.'s ditch that will pay from \$8 to \$16, and even more, to the man per day by the ordinary method of ground sluicing. All these will be worked as soon as water can be brought upon them.

When once these two enterprises alone are brought to completion, there will be as good a mining camp here as has ever been, and they will endure much longer than the creek and gulch mining, which once made this camp a famous and rich "bonanza" for the pioneers of '52.

An inch depth of rain on an acre yields 6,272, 640 cubic inches of water, which, at 277.24 cubic inches to the gallon, makes 22,622.5 gallons, or 226,225 pounds.

SEVERAL Cornish miners left Austin last week for New Mexico.

Mining at Happy Camp.

From a two column and a half communication of "Teutonic" in the Crescent City *Courier*, we glean the following mining items from Happy Camp and vicinity:

Mining, of course, is prospected at this season of the year with a vigor that knows of no pause or delay, and as usual, some are doing well, some bad, and some indifferent. The H. O. H. M. company, who for a long time were the held in the matter of taking out the "caro-seed," is about to relinquish that figurative appendage to the Chinese creek claim, owned by Mr. B. Reeves, which has produced, I am informed, thus far, \$5,000, at a daily expense of running the claim of about \$30. The H. C. H. M. company, however, has done well, too, although the last two "clean-ups" left but a small surplus after deducting the running expenses of the claim. Out of the first nine days' run they realized over \$2,000, and the next "clean-up" amounted to nearly \$2,000. At Bonker hill, after a spell of inaction, mining operations are prosecuted with a fair chance of success, and on Muk-a-Muk flat, which is owned and worked by the same company, things look hopeful, if not bright. L. B. Grider, who operates upon the bank of Grider's creek, among a mass of holders, is still inflexible in his belief, despite his so-so success thus far, that he will strike it rich, and has promised your correspondent to let him have a look at the first half bushel measure he succeeds in filling with the "dithy lucre." Jerry Lane, on Wingate hill, thus far has done poorly, barely making expenses. Many things, impossible in their nature to foresee or forestall, brought it about, prominent among which were the unusually early approach of the rainy season, and the continual breaking of his new ditch. The owners of Buzzard hill and Patrick bar talk about continuing their forces, for the purpose of conveying the waters of Moor's creek to Patrick's bar, where Tama says rich diggings exist. S. S. Richardson is busy in bringing his energies to bear upon his recent ditch, which ever and anon threatens to leave him, and take a trip down the Klamath. Up on Indian creek the miners are pretty effectually snowed in, which precludes mining operations, and the same is the case with those on Elk creek.

PRACTICAL EDUCATION IN PARIS.—A correspondent of the *Moniteur Industriel* communicates to that journal a description of a school of practical instruction, situated in one of the suburbs of Paris. The writer outlines a system of education in which the future occupations of the pupils are kept steadily in view, and where every step of progress in study marks an advance in real knowledge. A few instances will best show the method of instruction. Suppose a lesson in botany is to be given, and that the special subject is some textile plant. The pupil sees, in the botanic garden attached to the school, a few stalks of hemp growing. The botanic character of the plant is explained to him; he is told how it grows, and what are the conditions favorable to its growth; then he is shown how it is treated in order to obtain the fiber, how the latter is spun, woven, etc. In giving instruction on minerals, a like course is followed. For instance, the subject is iron ore: various kinds of ore are exhibited, the processes are explained, by means of models and designs, of the reduction of iron and its manufacture. So in mechanics: models of machinery are shown and explained; better still, the pupil is taken to the workshops, where he sees various kinds of machines in operation. His understanding of things is tested by questions and by being required to draw the objects he has been looking at, and to explain their working. Topography and geography are taught in the same common sense way, the pupil being led to map out an ever widening area.

THE LARGEST PHOTOGRAPHS IN THE WORLD.—Mr. B. O. Holtermann, the well known gold miner, and one of the richest men in the colony, claims to have produced the largest photographic views in the world. He has two views of Sydney and harbor, each five feet by three feet two inches, and two of four feet six inches by three feet two inches. These photographs, Mr. Holtermann claims, are the largest ever produced from single negatives. They give a complete view of the city and harbor of Sydney from Garden island to Long Nose. No. 1 negative, which is five feet by three feet two inches, takes in the space from Garden island to Dawes' point; the second, of the same size, embraces from Dawes' point to Miller's point; the two others, each four feet six inches, showing from Miller's point to Long Nose. Apart from the size of the pictures, they are splendid specimens of the photographer's art, the outlines being sharp and clear and the various objects shown coming out prominently before the eye. The difficulty of producing pictures of such size can be best understood and appreciated by photographers.—*Sydney Evening News*.

J. F. THOMPSON, of Virginia, recently returned from a trip to Europe, where he visited many mines, becoming acquainted with valuable improvements in European mining systems which has proposed to utilize on the Comstock. These improvements consist principally in ventilating and pumping machinery.

The Seattle & Walla Walla railroad company have contracted with J. M. Colman, of Seattle, to complete the first section of 15 miles of their road, and the work will be commenced immediately.

USEFUL INFORMATION.

Chromium Glue and its Applications.

This consists of a tolerably concentrated solution of gelatine, to which has been added for every five parts of gelatine one part of chromate of lime in solution. This mixture has the property, on exposure to light, of becoming insoluble in water, a result due to the partial reduction of the chromic acid to a lower degree of oxidation; this property has already been utilized to a considerable extent in several of the recent processes for photo-lithography and photo-engraving.

Schwarz proposes this combination as a cement for glass vessels which have been broken. The surfaces of the vessel to be cemented are coated as uniformly as possible with the freshly prepared glue, and are then pressed firmly together and held in this position by means of thread. The vessel is then exposed to the light for several hours, at the expiration of which time the operation is complete.

Boiling water does not cause the article thus repaired to separate, having no effect upon the new combination, and the joint is hardly perceptible. Valuable vases or other articles, instead of being disfigured by the ordinary mastic cement, should be mended by this process. It has been suggested that microscopic slides may be finished with this material, with advantage over the ordinary asphaltum varnish.

Chromium glue may be also utilized in the manufacture of water-proof cloth and paper impervious to moisture. The fabric, to be treated, should be stretched upon a frame and immersed two or three times in the preparation, and exposed to the sun. Damp proof paper may be prepared by simply brushing over the surface with a thin solution prepared as above.

A singular application of this combination of glue and chromium was made during the Franco-German war in 1870. At that time the well known pea sausage, one of the most important articles of food used in the German army, was prepared daily in many thousands of skins. The preparation of the interior portion caused little difficulty, but so many skins were not easily supplied. As the supply fell short a substitute was sought in parchment paper—prepared by dipping, for a short time, blotting paper in sulphuric acid, then washing and drying it. This paper was used for the fabrication of sausage skins by doubling the sheet into the form of a cylinder and pasting the edges. But no glue or gum can resist the effect of boiling water in which the sausage had to be cooked, and so the artistic sausage skin fell asunder. Dr. Jacobsen suggested the use of chromium glue as a cement; the gelatine intended for the sausage skins was mixed with a minute portion of bichromate of potassium, and the part cemented exposed for a short time to the sun. The experiment succeeded perfectly, for the artificial skins endured boiling water exceedingly well. The number of sausage skins prepared in this way by the chemical operation of light amounted to many hundred thousands.—*The Laboratory.*

Coloring Brass.

In the following will be found valuable details relative to the coloring of brass. An orange tint, inclining to gold, is produced by first polishing the brass and then plunging it for a few seconds in a warm neutral solution of crystallized acetate of copper. Dipping into a bath of copper, the resulting tint is a grayish green, while a beautiful violet is obtained by immersing the metal for an instant in a solution of antimony and rubbing it with a stick covered with cotton. During this operation the brass should be heated to a degree just tolerable to the touch. A more appearance, vastly superior to that usually seen, is produced by boiling the object in a solution of sulphate of copper. There are two methods of procuring a black lacquer on the surface of brass. The first, which is usually employed by instrument makers, consists in polishing the object with tripoli and washing it with a mixture composed of nitrate of tin one part, chloride of gold two parts. Allow this wash to remain for 15 minutes, then wipe it off with a linen cloth. An excess of acid increases the intensity of the tint. In the second method, copper turnings are dissolved in nitric acid until the latter is saturated; the objects are immersed in the solution, cleaned, and subsequently heated moderately over a charcoal fire. This process must be repeated in order to produce a black color, as the first trial only gives a dark green. Finally, polish with olive oil. Much pains are taken to give objects "an English look." For this purpose, they are first heated to redness and then dipped in a weak solution of sulphuric acid. Afterward they are immersed in dilute nitric acid, thoroughly washed in water, and dried in sawdust. To effect a uniformity in the color, they are plunged in a bath consisting of two parts nitric acid and one part rain water, where they are suffered to remain for several minutes. Should the color not be free from spots and patches, the operations must be repeated until the desired effect is produced.

METHOD FOR DETERMINING THE VALUE OF COALS.—Mr. L. Thompson, M.R.C.S., publishes the following as a convenient method for getting the economic value of coals: The apparatus required is a small cast iron crucible about the size of a common tea-cup, and furnished with a lid. This crucible should be as light and thin as possible. The one the author

now uses weighs six ounces, holds four ounces of water, and cost one shilling. Having obtained a fair sample of the coal—which is rarely practicable except one cwt. has been crushed under edgestones—redness an ounce of this to an impalpable powder, and carefully mix ten grains of this with one-quarter ounce troy of common salt, previously dried, and then add and thoroughly mix with this one ounce troy of chromate of potash; place the mixture in the crucible, put on the lid, counterpoise the whole with great care in the scales; then, allowing the counterpoise to remain, place the crucible in a common fire where it may become dull red-hot, and allow it to continue so for a quarter of an hour; after which take the crucible from the fire, and when cold, place it again in the scales, and notice how many grains it has lost; then deducting from this the weight of the coal (10 grains), the remainder represents the quantity of oxygen carried off by the really useful combustible constituents of the coal. This he has found to vary in the coals supplied to the London market from 19 to 28.—*London Chemical News.*

HOW TO CLEAN A METAL CLOCK.—An English writer says: Dip a feather into common paraffine oil, such as is used for lamps, and touch up all the oily places of the clock, especially axles and holes; then let the clock stand a few hours, give more paraffine, and touch oftener if you think it is better for it. Afterward strew strong washing powder among the wheels, etc., and plunge the clock into a strong solution of the same in boiling water. Let it lie there in till the water gets cool enough to place your hands in, when with a toothbrush rubbed with soap wash out the dirt from the works. Afterward cleanse completely from all trace of soap and powder in plenty of warm water and the operation is complete.

PURIFYING WATER WITH ALUM.—Alum will only purify water from organic impurities, which it will precipitate in the same manner as it precipitates dissolved coloring matter in the manufacture of lakes from dye woods. One teaspoonful of pulverized alum in four gallons of water is sufficient. If the water contains such an amount of impurities that this quantity will not purify it it is unfit for drinking purposes. In the artificial manufacture of ice from Mississippi river water, at New Orleans, this method is employed to purify the water before freezing it.

TO SILVER CAST IRON.—To silver cast iron, 15 grains of nitrate of silver are dissolved in 250 grains of water, and 30 grains cyanide of potassium are added, when the solution is complete, the liquid is poured into 700 grains of water, wherein 15 grains of common salt have been previously dissolved. The cast iron intended to be silvered by this solution should, after having been well cleaned, be placed for a few minutes in a bath of nitric acid of 1.2 specific gravity just before being placed in the silvering fluid.

GOOD HEALTH.

Gelsemium Sempervirens in Neuralgia.

This article, which has had reputation in this country for neuralgia, has attracted little attention in Europe. It has been recently tried at the dispensary at Heidelberg by Dr. Jurasz, assistant physician, who has reported favorable results. Five minims of the tincture were given three times a day for three days to a man aged 30, who had been suffering for a week with neuralgia of the right supra-orbital nerve, which cured him. The same dose given for six days gave permanent relief to a woman who had had brachial neuralgia on the left side for more than a year and a half, and been treated with various other remedies without success.

Two other neuralgias of the fifth nerve were rapidly cured with five and ten minim doses; and a case of very severe sciatica on the right side in a man of 60, which had completely disabled him and confined him to bed, was quickly relieved by eight minim doses three times a day, and the patient was able in a fortnight to walk with a stick; the cure being completed by warm baths and the use of the constant current.

On the other hand, the gelsemium failed completely in two cases of muscular rheumatism, and in a case of long standing hemiplegia.

In no instance was any unpleasant effect observed, either on the circulatory or digestive organs; but the dose of 20 minims was never exceeded.—*Journal Medical Sciences.*

SWEET OIL FOR POISON.—A farmer writes to the *College Courier*: It is now over 20 years since I heard that sweet oil would cure the bite of a rattlesnake, not knowing that it would cure other kinds of poison. Practice and experience have taught me that it will cure poison of any kind, both on man and beast. The patient must take a spoonful of it internally, and bathe the wound for a cure. To cure a horse, it takes eight times as much as for a man. One of the most extreme cases of snake bite occurred 11 years ago. It had 30 days' standing, and the patient had been given up by his physicians. I gave him a spoonful of the oil, which effected a cure. It will cure blot in cattle caused by fresh clover. It will cure the stings of bees, spiders, or other insects; and persons who have been poisoned by a low running vine called ivy.

Dyspepsia from Eating Hot Bread.

Gen. Clingman tells some truths and offers suggestions about the causes and results of dyspepsia and indigestion, with special reference to hot, doughy bread, which will apply to all parts of the country. Read and heed: It has been said that the frying pan is an enemy of our people. There can be no doubt that it has slain thousands; but hot bread is the slayer of tens of thousands. While traveling in Europe for eight months, I saw nothing but cold bread, nor did I, while there, see anything that tended to induce me to believe that anybody in Europe had ever eaten a piece of hot bread. I invariably, however, found the bread good, and the people I saw appeared healthy and robust. Some, as the English and Germans, were especially so. With respect to the United States, the condition of things may be more strikingly and pointedly presented by reference to individual cases. Many ago years I stopped at a house of an acquaintance, and on seeing him I said "You are not looking as well as usual." "No," he replied, "I have the dyspepsia powerful bad." When dinner was ready there was an abundant supply of meats and well baked corn bread. There was also, however, something called biscuit, which was, in fact, rather warm dough, with much grease in it. I saw that my host ate this freely with his meats. I remarked that I did not wonder he had dyspepsia, for I could not live a month that way. I suggested that if he would eat well baked corn bread, or better still, light bread, he would not suffer as he was doing. He answered vehemently that he would rather die than eat cold bread. I replied: "This is a free country, and you have a right to die in this mode if you choose, and I have no doubt that you will soon die." Then I referred to cases in which I had known people to die from such practices. My cool mode of discussing the question evidently made an impression on his wife. Next summer, on meeting him, I said: "You are looking much better." "Yes," he replied, hurrying into a hearty laugh, "I followed your advice and took to eating light bread, and I am as well as I ever was in my life."

BREAKING DOWN.—Men often have their hands full, are overcrowded with business and drive hurriedly along at it, but they may not be overworked. We cannot always tell when we are overworked. A man does not always know himself, no more than he knows the strain on the mainspring of his watch that will break it. But there comes a time when it breaks—a click, a snap, and the watch stops. Men break down in this way. They go on, day after day, the pressure being harder each successive day, until the vital force gives out, and the machine stops. It is a great pity that the indications of this state of things cannot be seen beforehand, and if seen, regarded. It is one of the last things that men will admit to themselves, much less to others. They flatter themselves that it is only a little weariness of the flesh, which will pass off with a few hours' rest, when in fact, every nerve, power and resource is exhausted, and the system is driven to work by sheer force of the will. When the oil on the shaft or in the wheel wears on the revolving part, and soon will ruin it. The same is true of the human body.—*American Manufacturer.*

EFFECT OF THE SEASONS ON THE BODY.—The curious fact has recently been pointed out by Dr. B. W. Richardson that the changes of the seasons have a potent physical influence upon the body. Some years ago, in a convict establishment in England, a number of men were confined amid surroundings (of clothing, room, food, etc.) practically the same for each individual. The medical superintendent of the jail undertook investigations, extended over some nine years, and during which over 4,000 individuals were weighed. It was found that during the months of winter the body wastes, the loss of weight varying in increasing ratio; that during summer the body gains, the gain varying in an increasing ratio; and that the changes from gain to loss and from loss to gain are abrupt, and take place, the first at the beginning of September, and the second at the beginning of April. This is shown in the following figures, indicating the ratio of loss or gain: Loss: January 0.14, February 0.24, March 0.35. Gain: April 0.03, May 0.01, June 0.52, July 0.08, August 0.70. Loss: September 0.21, October 0.10, November (exception) a slight gain, December 0.03.

STENCILLING MATERIALS FOR PAINTERS' USE.—Stencilling is an art by which the painter can execute ornamental work very quickly. The articles required in making a stencil are a sheet of well sized writing paper, a lead pencil, and a sharp penknife. Fold the paper, allowing the edge of the fold to form the center of the pattern, then draw any desired design, leaving bare to hold the parts together. Place the paper upon a piece of glass and cut out the figure with a penknife. The tool used is a camel's hair brush with hair not over an inch long, bound with quill and wire on a round wooden handle. The small sizes are preferable. Color mixed with vinegar and sugar will be found best. The paint must be quite thick; and a small quantity only must be taken on the brush, and then well rubbed out on a dry plate before applying it to the work. Placing the stencil on the panel as desired, hold it down firmly, and rub over with the brush carefully until the cut portions of the figure are well coated. Then lift off the stencil and the work is completed.—*Scientific American.*

DOMESTIC ECONOMY.

Hints on Pastry Making.

The following hints on pastry making, by an old housekeeper, are worthy of study. The Americans are too much addicted to pastry, but since the taste is already formed, it remains only, in the preparation of such food, to make it as little injurious as possible by making it good.

The art of making paste requires a good memory, practice and dexterity; for it is principally from the method of mixing the various ingredients of which it is composed that paste acquires its good or bad qualities.

Before making paste wash the hands in hot water; touch the paste as little as possible, and roll it out little; the less the better. If paste be much wetted it will be tough.

A marble slab is better than a board to make paste on; both, together with the rolling pin, cutters and tins, should be kept very clean, as the least dust or hard paste left on either will spoil the whole.

The coolest part of the house and of the day should be chosen for the process during warm weather.

Flour for the finest paste should be dried and sifted, as should pounded white sugar.

Butter should be added to paste in very small pieces, unless otherwise directed.

If fresh butter be not used, break salt butter into pieces, wash it well in spring water to cleanse it from salt, squeeze it carefully, and dry it upon a soft cloth. Fresh butter should also be well worked to get out the butter-milk.

After the butter has been pressed and worked with a wooden knife on the pasteboard, press it very lightly with a clean soft cloth, to absorb the moisture. If good fresh butter is used, it will require very little, if any, working.

Lard is sometimes used instead of butter, but the saving is of very trifling importance when it is considered that, although lard will make paste light, it will neither be of an good color or flavor as when made with butter.

Dripping, especially from beef, when very sweet and clean, is often used for kitchen pies, and is, in this instance, a good substitute for butter, lard, etc.

In hot weather the butter should be broken into pieces and put into spring water, or into ice; but on no account put the paste into ice, else the butter in it will harden it, and in baking, melt, and separate from the paste.

The same thing happens in winter, when the butter has not been sufficiently worked, and the paste is rather soft; for, though the season be favorable to the making of paste, care must be taken to work the butter sufficiently.

In winter, paste should be made very firm, because the butter is then so; in summer, the paste should be made soft, as the butter is then the same.

It is important to work up paste lightly and gradually into a uniform body, no strength nor pressure being used.

It is necessary to lightly flour both sides of paste when you roll it, in order to prevent its turning gray in baking; but, if much flour be sprinkled on it, the paste will not be clear.

Attention to the rolling out is most important to make light puff-paste; if it be too light, it may be rolled out once or twice more than directed, as the folding mainly causes it to rise high and even.

Be sure, invariably, to roll puff-paste from you. Those who are not practised in making puff-paste should work the butter in by breaking it into small pieces, and covering the paste rolled out; dredge it lightly with flour, fold over the sides and ends, roll it out very thin, add the remainder of the butter, and fold and roll as before.

To insure lightness, paste should be set in the oven as soon after it is made as possible; on this account, the paste should not be begun to be made until the oven is half heated, which sometimes occupies an hour. If paste be left 20 minutes or more before it is baked, it will become dull and heavy.

Paste should be light, without being greasy; and baked of a fine color, without being burnt; therefore, to insure good baking requires attention.

Puff-paste requires a brisk oven; a moderate one will best make pies and tarts, pudding and biscuits. Regulation of heat, according to circumstances, is the main point in baking.

If the oven be too hot, the paste, besides being burned, will not rise well; and if it be too slack, the paste will be soddened; not rise and want color. Raised pies require the quickest oven.

When fruit pies are baked in iron ovens, the syrup is apt to boil out of them; to prevent this, set a few thin bricks on the bottom of the oven before it is heated; but this will not be requisite if the oven has a stone bottom.

Tart tins, cake molds and dishes should be well buttered before baking; articles to be baked on sheets should be placed on buttered paper.

APPLE PIE.—Take nice, tart apples—Spitz-enbergs are best, although Pippins, Greenings, Russets, etc., are excellent. Slice them; fill the under crust an inch thick; sprinkle sugar over them; add a spoonful or two of water; cover with a thin crust, and bake three-fourths of an hour in a moderate oven.

NOSE CHEAP PUDDING.—One quart of milk; four tablespoonfuls of flour; four eggs; six tablespoonfuls of sugar; nutmeg. Steam three-fourths of an hour.



W. B. EWER, SENIOR EDITOR.

DEWEY & CO., Publishers.

A. T. DEWEY, OEO. R. STROGO
W. B. EWER, JNO. L. BOONEOffice, No. 224 Sansome St., S. E. Corner
of California St., San Francisco.

Subscription and Advertising Rates:

ADVERTISING RATES.—1 week. 1 month. 3 months. 1 year.				
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Prompt Subscriptions.

We wish to thank those subscribers who send in their renewals to the Press promptly as regularly as the year comes round. It saves us much expense in commissions for collections and renewals. May we not request more of our good patrons to do so!

THE ORIGINAL ARTICLES in this paper are mostly as in solid type, giving in our columns one-third more reading than is contained in ordinary leaded matter.

Our latest forms go to press on Thursday evening.

San Francisco:

Saturday Morning, May 6, 1876.

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A "FAMILY GATHERING."—We don't not our readers will be pleased to hear of a little "family gathering" of the proprietors and attachees of the Press and a few personal friends, which took place in this city on Saturday. An informal gathering was had at lunch time to bid God-speed to our senior editor, Mr. W. B. Ewer, on his journey to the Centennial. After a wholesome luncheon and friendly converse, a pleasant presentation took place, in which Mr. Ewer received a very handsome rosewood case, mounted with gold and quartz, with this inscription: "W. B. Ewer, A. M. 1876: From his Partners." The case was a model of handsome work from the store of Dewey & Jordan, 433 Montgomery street, San Francisco. It bears upon its head a sample of our richest produce and may express to our Eastern friends new evidence of our inexhaustible resources. As Mr. Ewer carries it on his journey it will assure him of the kind feeling of those he left behind him. And when he warlike amid the busy display to which he is going, let it support him with its own strength and with a consciousness that those from whom it came to him are waiting to welcome his return to his beloved Western home.

J. C. JAMES, the engineer who has done the surveying required in the Consolidated Virginia and California mines, says there is no foundation for the intimation that the Consolidated Virginia have been mining ore from the California ground. On the contrary, work in these mines is carried on as it would be if the companies had no interest in common.

Montana Mines.

There are a great many persons who have an impression that the mining interests of Montana amount to very little. They remember the halcyon days when the shallow placers of the Territory yielded fabulous amounts of gold, when fortunes were made in a few weeks, and the days of '49 in California were almost equalled. But these placers were mostly worked out some time since, and the miners have had harder work to get the gold and get less of it, too, than they used to. Still it is by no means the case that all the Montana surface diggings are worked out, and her quartz interests show greater activity than ever before. We had a conversation this week with a gentleman who has spent the last six months in Montana, and from him we have obtained some general facts of interest to the mining community.

In speaking of the placers, he says even in that line an improvement is manifest. There is an immense amount of ground which would pay but for two reasons: One is that it is so nearly level and the other is the difficulty of getting water. There is plenty of water everywhere, but the trouble is to get it high enough. The dam question, under these circumstances, is also a very difficult one to solve. Most of the early ditches were too short and constructed to feed limited areas of ground. But now they are building larger ditches to command higher ground, but such enterprises are expensive and require a large amount of capital, the same as in California, so ordinary working miners are unable to carry them out.

There are many places along the Missouri river where there are bars and bank washings, but they do not amount to much. However, if the stream could be turned, an immense amount of gold would in all probability be taken from the bars. Nothing but a very heavy operation could do anything in this direction. The big Alder gulch, which built up Virginia City, is claimed to have produced all the way from \$30,000,000 to \$70,000,000, and paid the whole length of 14 miles. They still work here every summer. Another famous canon, "Last Chance gulch," built up the city of Helena. In this gulch they are now building a long bedrock flume, which they are going to take all the way up. About a mile of it was built last summer. The gulch is very deep, and formerly pits were sunk and the dirt hoisted out. With the ditch they will be able to work much lower down and get on the bottom, where they could not work advantageously before. The ditch is being built by Mr. Chisholm, the owner of the water privileges. There are many other placer grounds all over the Territory, but those spoken of are the most prominent. In most instances it takes great trouble and heavy capital to get in the water, and get over the difficulty of lack of dump.

The quartz mining interests show steady improvement. There are gold mines there which have been worked a long time. The old Whit-latch Union mine was worked before Last Chance gulch was discovered. The number of copper mines worked is steadily increasing. Last winter was the first one in which some of these mines were worked continuously through the winter. All the ore from the copper mines is shipped down the river to St. Louis and Baltimore, none of it being worked in the Territory. From Helena to Benton—90 miles—it costs about \$10 per ton to haul it, and they ship it from Benton, the head of navigation, down the river for from \$7 to \$10 per ton. If the river is ever improved, Montana needs no great railroad, as the water highway would be the best. A bill has been passed by the Legislature, granting a right for a railroad from Helena to Benton. Below that the river runs through a flat country and spreads out over a wide surface in many places, where training walls or jetties are needed to deepen and confine the channel.

The gold were the first quartz mines worked. The surface quartz was worked out but they quit when they got to the pyrites. Then came the copper mining, which is now the rising interest. They are working these mines in four different localities, there being a number of different mines at each. To eliver more and more attention is being paid. In the early days of this class of mining the Washoe process was adopted, it having succeeded well with some of the Idaho mines as well as at its home. But the process was not successful, the ore were unfit for that method of treatment, or rather, the method was not the proper one. After working rather unsuccessfully for some years with raw ores, silver mining came to a standstill. There is now only one mill working by this process in the Territory—the Hope mill at Phillipsburg. Smelting was then tried, and at a considerable expense and loss. There is now only one furnace running periodically, which, when it can get the right ore, does very good work.

More attention is now being paid to roasting the ores, and two new mills for roasting and amalgamation were built since last summer. These are the "Farlin," at Butte, and the "Northwest," at Phillipsburg. There are also two mills operating by the Turner process—the "Centennial," at Butte, erected last winter, and the "Kemp" mill at Jefferson. The Turner process is pretty much the same

as the old patio; they use sulphate of iron instead of sulphate of copper.

The Northwest mill (which we described in detail in a recent issue) has three Bruckner cylinders and ten stamps. The Farlin mill has ten stamps and reverberatory furnaces. The Centennial and Kemp mills have each five stamps. All of these are silver mills, and our informant thinks they will make a success of the silver mining.

He thinks, moreover, that the country has been very poorly prospected. It has leached under the disadvantages of not having had a market for ore, and of having severe winters. Only first-class ore would stand shipment. It costs now to ship ore East, taking into consideration freight, interest, etc., about \$100 per ton, beside the very long time they have to wait for return. As to the lithology of the country, the main Rocky mountain range is granite flanked by limestone. The spurs which run out are covered with limestone, and the mines are found both in the granite and limestone.

Virginia City and Comstock Mines.

NUMBER ONE.

[By our Resident Correspondent.]

A protracted stay in Reno only strengthened the conviction that there is a bright prospect ahead for this active town. The rapid increase of the agricultural population, the advance in the price of land and the encouraging developments in the operations of the mining companies have given a good end-off to the spring business, and it might be supposed there was nothing else required to make the full measure of their wants. But they are by no means satisfied, and are earnestly disavowing the establishment of manufacturing enterprises, particularly that of a woolen mill, which, in view of the large quantity of wool that goes there in search of a market, and the water power furnished by the Truckee, would seem to be a suitable industry. Unfortunately, the location best adapted to this undertaking is practically beyond the reach of any useful purpose. This, the Nevada land and mining company's property, consists of a large tract of fine land in one of the best portions of the valley, a valuable water franchise and so ore mill not now operated. The water power here is ample for a large establishment and is ready for immediate use, while enough water remains to irrigate the whole tract and leave a surplus for sale. The mill building and some of the machinery remain in good condition, and could be readily converted into a factory of any kind. The other buildings are in a good state of preservation, some of which are commodious and well arranged dwellings. But all these advantages go for nothing while a complicated lawsuit hinders the sale and use of the property for any purpose. Any gentleman who desires the lasting gratitude of the dwellers in Reno can obtain it by untying this knot and placing the property with a clear title on the market.

As the passenger trains of the Virginia and Truckee railroad pass each way at night, there are but few persons who see anything of the country through which this wonderful road is built. A good opportunity is afforded for a day trip by laying over at Reno until 12 o'clock noon and taking the accommodation train, which makes the trip in about six hours. Although slow, it will not be found tedious, and a sight of this route will dissipate some of the false impressions which strangers are sure to get when they arrive at Virginia City just at daylight and see only barren mountains on every side. Then, too, the early morning is not the best time at which to arrive. When the Eastern tourist, or even the "Frisco man," wakes up and gets out of a warm car and, satchel in hand, tramps around these breezy hills in search of a lodging, and consumes a half day in finding one in which there is neither stove nor fireplace, his enthusiasm is endangered, and he is compelled to remind himself continually of the mines of wealth over which he is supposed to be trudging, in order to retain the necessary courage for those things which are in sight.

Since the fire the population has been too large for the number of houses, but they are rapidly being rebuilt, as are also the hotels, so that this state of things will not last long. A trip over the road by day shows that it passes for a large part of the way through fertile valleys. Fine grass and grain land is in sight all the way to Carson, and it is readily seen that an industrious population here could sustain a large number of workers in the metal-mined mountains around them. Hay, oats, potatoes and many other products give large returns, and are assuming more and more importance each year, making it evident that the purely mining towns will not in the future have to send so far for these necessities.

Many places of interest are pointed out along the way. At Hufaker's the Pacific flume company delivers its immense transportation of wood and lumber, which is all used here. Mr. Harst's (the superintendent of this company) invitation to take a ride down the flume was not accepted, for fear that the MINING AND SCI-

ENTIFIC PRESS might be temporarily left without a representative at Virginia City, and for the further reason that your correspondents are so little used to a speed of 18 miles in 15 minutes.

Several other flumes discharge their loads at various points, and soon a sulphurous smell denotes the proximity of Steamboat springs with its curious surroundings.

The sulphur works there are said to be among the most profitable enterprises in the State, and the proprietors do not seem in the least dismayed or discouraged by the opinion of some people that they are just over the lake of fire and brimstone.

Washoe City, the next place of any note, will be remembered by many for the bright anticipations it once had of large growth and permanent prosperity. Evidence of former industry are visible on all sides, now replaced by deserted stores and desolate dwellings. A fine view is afforded of Washoe lake in its whole extent, and a sight of this beautiful sheet of water in itself repays for the delay of the trip. Almost while taking the last look at the lake, the divide is passed which separates this from the Carson valley, and Carson City is in full view far below the bed of the road. This is one of the finest views on the route and Carson is probably the handsomest town in the State. The bird's-eye view from this elevation gives it much the appearance of a neat, well laid out New England town.

From Carson to Virginia we are principally engaged in winding and climbing up mountain ends winding and gliding down the other side, the road repeatedly doubling on itself until at last Gold Hill is in sight, apparently just across a ravine; but when the unsuspecting traveler thinks he is about to get there, he suddenly finds that his back is turned towards it and he is going in another direction. This, however, cannot last forever, and after a few more twists and turns he arrives first at Gold Hill and in a few minutes afterwards at Virginia City, thoroughly impressed with the difficulties encountered in building this railroad, and much pleased with all he has seen on the way.

It is proposed in future letters to give you the history and workings in detail of some of the mines in these districts about which very little is known. At the East and abroad there is no proper conception of the magnitude of mining operations here, nor of the undeveloped wealth which only awaits the judicious investment of capital. Hence there is a large and open field for work.

Virginia City, Nev., May 1st, 1876.

Gems and Precious Stones.

[Written for the Press by HENRY G. HANES.]

(Continued from last week.)

Diamonds are valued according to their weight, purity of color, freedom from defects, etc. Much depends also on the state of the country where they are for sale. When times are prosperous and money plenty they will find a readier sale than when the reverse is the case. There is no rule which gives the absolute value of first-class diamonds. But the trade is governed to a great extent by the formula devised by Jeffries, to whose work I have before alluded.

His tables assume that diamonds increase in value proportionally to their increase in size. At the time his tables were calculated it was assumed that rough diamonds, both good and bad, averaged \$10 (£2) per carat. (1 carat = 4 grains).

To ascertain the value of any rough diamond he multiplied the square of its weight by the value of one carat. Thus, if a rough diamond weighed five carats, its weight would be $5 \times 5 \times \$10 = \250 .

A cut stone was calculated differently. It was taken for granted that a rough diamond loses half its weight in cutting, therefore the calculation was made on the value of a rough stone of double the weight; for example: for a cut stone of five carats, $10 \times 10 \times \$10 = \$1,000$, and to this price was added the cost of cutting.

The value of diamonds has largely increased since that time (1750), and in 1865 a diamond of five carats was worth in London £350, or \$1,750, reckoning the pound at \$5. The same authority from which I take this valuation says that the stone must be free from the faintest tinge of color of any sort, from any flaw, speck, marks or fissures in any sort, must be bright and lively and free from what is technically called "milk" or "salt." The stone must also be cut in perfect proportion, according to the rules before given. This author also says that it is impossible to calculate the value of a stone above five carats, as the price depends wholly upon the supply and demand.

When a diamond has a decided color it is called a fancy stone, and will bring a very high price.

Unfortunately, the temptation to produce large-surfaced stones at the expense of the rules of true proportion is so great that perfectly cut stones are seldom seen. To own a perfect diamond is to possess a gem in a double sense.

[To be Continued.]

The general appropriation bill, as passed by the House Friday, contains a provision that assays for private parties shall be made by the mints, at prices to be prescribed by the Secretary of the Treasury, and that the fees shall be turned over to the Government.

The public schools of this city held their annual picnic on Mayday.

Our Centennial Views.—No. 1.

We are pleased to announce to our readers that we are ready to begin our Centennial campaign, and can promise condensed reports of all interesting characteristics of the grand exhibition as they are developed during the summer. Our senior editor, Mr. W. B. Ewer, is now on his way to Philadelphia, where he will remain for some time, and furnish us with everything of interest. It is our intention to pay more particular attention to all metallurgical and mechanical improvements that may be useful on this coast, and Mr. Ewer's experience of the necessities in this line will lead him to select for description those which would be most appreciated here. He will give us everything in a condensed form, and procure for us drawings and engravings of such things as merit particular attention. If any of our readers desire further information of such things as they see mentioned elsewhere, we shall be pleased to communicate their desires to our senior, who will endeavor to gratify their curiosity as far as possible. Our readers can

Japanese display. The judges' pavilion commands the interspace between the main and machinery buildings. The music pavilion intersects Belmont avenue, which leads obliquely through the grounds beyond the lake. In different directions the walls of the American, French and other restaurants are visible, and the pavilions and cottages to be occupied by the commissioners and agents of Germany, Sweden, Turkey, Morocco and other foreign countries, and by those of Pennsylvania, Ohio, New Jersey, Indiana, Illinois, Missouri, Kansas and other domestic States, are in all stages of erection in different parts of the enclosure. From 150 to 200 separate structures will cover altogether some 75 acres.

Upon the highest ground in Fairmount park, a short distance north of the enclosure round the exhibition grounds, there has been erected an observatory 150 feet high. From this the view of the grounds, the city and its environs will be uninterrupted, even by the tallest primeval trees that beautify the banks of the Schuylkill.

The plan of the grounds embraces seven miles of roads and foot paths, bridges across shaded and precipitous ravines, summer houses, and numerous fountains fed by water

NEW ASSAY OFFICE AND CHEMICAL LABORATORY.—Price, the well known chemist and assayer, many years connected with the San Francisco assaying and refining works, has fitted up the old Pacific Mail building, 524 Sacramento street, corner of Leidesdorff, as an assay office and chemical laboratory. The interior of the building has been entirely remodeled to suit the present requirements. On the right hand on entering is the main office, with counters, safe, bullion scales, desks, etc. On the left, and enclosed from the main room, is the assay office. This is very neatly fitted up. It contains a ducing and two cupel furnaces and all the requisite fittings for a first-class assay department. Next to this is Professor Price's private office. In the rear of the main office is a sampling room, with apparatus for crushing ore for sampling, etc. Next to this is the melting room, in which there are four furnaces and all needful conveniences. The laboratory for analysis, etc., is up stairs. All the rooms are light and airy, and fitted up with all the modern appliances in the best and most substantial manner. Professor Price is pre-

Dom Pedro in the "Press" Office.

Every one concedes that Dom Pedro d'Alemtara, the Brazilian emperor, who recently paid our city a visit, is conducting himself in a manly, straightforward manner. His entire freedom from display, his plain unassuming style of traveling and mingling with our people, has created a feeling of friendship and good will towards him and his country that will do much towards removing our prejudice against royalty and the countries that are ruled by crowned heads. While in this city Dom Pedro exhibited a praiseworthy interest in mechanical novelties and new inventions. He even took the trouble to visit the Scientific Press Patent Agency, to examine an invention for which we are securing a patent for the inventor. Indeed his interest was so great that he even spent some two hours in trying to find the inventor, Mr. R. H. H. Hunt, in order to have him present to explain the invention, driving in his search to Mr. Hunt's residence on Twentieth street and then back again to our office. The Emperor readily comprehended the ideas involved in the invention, although its details



FAIRMOUNT PARK AND THE CENTENNIAL BUILDINGS.

rest assured that we will furnish much material of interest concerning new mechanical appliances, with illustrations when necessary.

We begin our Centennial articles this week with an illustration giving a view of the whole field, the location of the buildings and methods and avenues of approach. By keeping this plan for future reference our readers can very easily follow our glances from place to place and realize better the scenes which we will describe for them.

In front of the machinery building is a lake, in the center of which appears a future fountain. Other lakes and ponds gleam here and there in the sunlight. Beyond the lake, a little to the left, is the United States Government building, picturesque from the distance. Farther off, to the right, the horticultural building shows its graceful outlines and bright colors. Midway between it and the Government building, is the women's pavilion, over the turrets of which, towards the remotest angle of the grounds, the tinny roof of the agricultural building turns like a shield the blinding lances of the sun. Away to the left, toward the famous Belmont drive, the buildings constructed by the British commission are situated, and a little further on a dark cordon of sight-seers surrounds the Japanese workmen in native costumes at their task of putting up the strictly Japanese buildings which are to accommodate the Japanese officials and a certain part of the

supply equal to that at Versailles. The George's hill reservoir, just outside the enclosure, contains 40,000,000 gallons; but in addition to this source the grivir, which leaves the northern rim of the exhibition grounds, will supply through pumping engines 6,000,000 gallons more a day. Not only the fountains, but the boilers of the steam engines in the main building, the machinery building and agricultural hall, are thus to have plenty of water; and the mains and drains, complete for all emergencies, will be thoroughly drenched and purified.

HARBOR OF REFUGE ON THE PACIFIC COAST.—Luttrell says the proposition for which he secured the sanction of the House to-day to obtain a survey by the Engineer Department of Mendocino, Trinidad, Humboldt and Crescent City harbors, with a view to reporting the best location and probable cost of breakwater and harbor of refuge, was defeated in the House Committee by Piper, but that the present action is just as efficacious as the enactment of his provision in the river and harbor bill would have been.

SEVERAL of the coal leads of the Pnyallup mines have been recently opened, and an expert has been sent for to come from the East to make a thorough examination and test of the mines and coal.

pared to make assays of metals and ores as well as complete a practical analysis of all minerals, salts, waters, or other substances. Particular attention will be paid to the chemical department. There is a complete analytical laboratory in addition to the assaying and bullion rooms. Bars are received for melting, and the refining will be attended to. Eventually a complete gold and silver refinery will be added. Professor Price has been long and favorably known to the public as a thorough chemist and metallurgist, and will, no doubt, get his fair share of business. He has everything arranged at his new laboratory after his own designs, and no expense has been spared in procuring the necessary appliances or in the arrangement of the building.

THE COMSTOCK LONE.—We shall soon publish, perhaps in our next number, an illustrated article on the Comstock lode, showing the manner in which the rich ore is distributed in the vein, and presenting a theory in reference to its pay shutes, with suggestions of rules to be observed in prospecting. The matter is one of interest to mining engineers, mine owners, financiers and speculators.

MESSENGERS, GEORGE S. DONOE, Josiah Earl, W. W. McCoy, Josiah Belden and F. MacCrellish have been appointed the Executive Committee for the Pacific Coast Centennial Committee.

were very complicated and required a special knowledge of one of our leading industries to enable him to comprehend its new features. Altogether we look upon Dom Pedro as a model emperor, and wish they were all of his stamp.

ACADEMY OF SCIENCES.—A large number of interesting donations to the museum of the Academy were received at the last meeting, among them a great many minerals. W. N. Lookington read a paper describing a new species of snake, and another describing a new species of crustacean. W. G. W. Harford also described a new species of crustacean. Professor Davidson read a short paper, by permission of the Superintendent of the U. S. Coast Survey, on the telegraphic determination of the latitude and longitude of San Francisco and Seattle, showing the delicacy and accuracy of the operation. He also read a second paper on "Irrigation in British India," describing and criticising in detail the canals of the Ganges, and its tributary, the Jumna; with their levees, dams, locks, sluices, falls, currents, aqueducts, and distributaries. The paper was strictly confined to the scientific engineering features and principles of the works described, and several errors of the British engineers were pointed out, while their works in general were credited with great boldness and originality.

The Pancake Coal Mine.

During the past few months a large amount of work has been performed at the above mine, in order to place it in better working condition. A double compartment shaft is being sunk and is now down a distance of 215 feet, thoroughly timbered. The sinking of the shaft will be continued. A seam of coal has been already cut and it has been fully demonstrated that sufficient coal upon this level can be extracted to go a great way toward supplying the Eureka market. The pumps and machinery need at the mine are all in fine order. A temporary delay is now being suffered, awaiting the arrival of an additional holler now on the way to the mine, but owing to the bad condition of the roads the transportation proceeds slowly. The mine will be in full blast in two or three weeks, and the shipping of the coal to this place will, in all probability, commence next June. Should the coal answer the purpose, and it promises so to do, a large amount will be required for use at the Richmond smelting works, for the refinery department, and this, added to the demand that will arise from other sources, will give the coal a ready market. The parties owning the mine have labored energetically for years to develop their property, and at a great expense have now succeeded in carrying out their undertaking. We hope that they will yet have a bonanza of black diamonds that will amply repay them for their years of labor and expense incurred in bringing the mine to its present condition.—Eureka Sentinel.

BOYISH DESTRUCTIVENESS UTILIZED.—A recent report of the French *Société Central d'Agriculture et d'Horticulture* states that for some years past one of the principal objects of the society has been to encourage the destruction of injurious animals, particularly insects, and the protection of insectivorous birds. The principals of several schools have seconded these efforts in a most praiseworthy manner. Schoolboys, as a rule, are rather destructive, and advantage is taken of this disposition to kill something. Prizes are offered for the destruction of vermin of all sorts, and at the same time for the preservation of useful birds. Eleven schoolboys in one school destroyed each 1,666 insects, of various sorts, besides 42 nests of caterpillars; and they protected 27 nests of useful birds, sheltering 143 young. This is only one of several cases reported, the numbers of which are mostly much higher. It would appear that insectivorous birds have been almost exterminated in some parts of France, and injurious insects have increased proportionately, so that they have become a formidable scourge.

Banking.

The Merchants' Exchange Bank
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G. MAHE, Director.

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Money Loaned on Leading Stocks.

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SAN FRANCISCO.

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BOOK BINDERS,

Paper Rulers and Blank Book Manufacturers,
505 Clay street, (southwest cor. Sansome),
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Manufacturer of

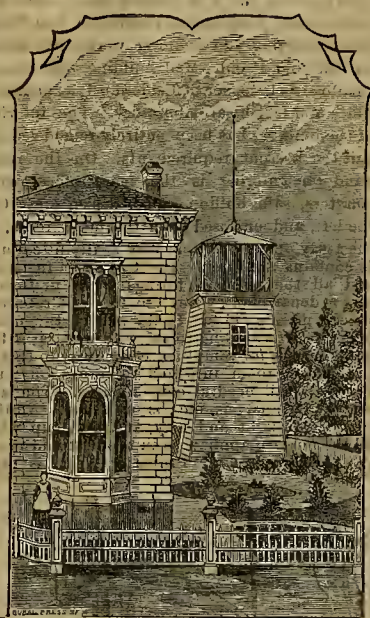
Dr. Bly's Patent Artificial Limbs.

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Simplest, Cheapest,
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ONLY PERMANENT WINDMILL
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SIMPLEST, because it is less complicated; CHEAPEST, because it never needs repair, standing on a firm foundation; MOST DURABLE, because it is all under cover, and has less rigging to get out of order; ONLY PERMANENT, because the only Windmill in the world that has never been injured by storms. Hundreds of people, who have thought the Dexter perfect, will be glad to observe the SUPERIORITY OF THE TURBINE over all predecessors. Although much improved, the price of this remains the same as formerly. Persons who study their own interest will investigate the TURBINE before purchasing any other.

Territory for sale outside of California, at reasonable rates and easy terms.

Mills built to order of the best material, and at the shortest notice, by Kimball Manufacturing Company, corner Fourth and Bryant streets, San Francisco. Any orders sent to their address will receive prompt attention.

For further information regarding Mills or Territory, send for New Circular. Address,

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CHLORIDIZING FURNACE.

Guaranteed to Chloridize from 85 to 95 per cent. of any gold or silver ores that are not more profitable for smelting. Will also desulfurize ores and put them in proper shape for working in cupola furnaces.

Cost of Roasting and Chloridizing by this Process:

Two cords of wood at \$6.....\$12.00
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15 lbs of salt at 15c.....2.25
Wear of shoes and power.....1.50

Cost for 15 tons.....\$44.00
Cost for one ton.....2.93 1/3

In a furnace of three or four times this capacity the cost is decreased by 20 per cent.

The furnace is now working successfully at the Poe Consolidated Co.'s mines, in the Peavine District. For further information, apply to

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Reno, Nevada.

NEW ASSAY OFFICE.

Thomas Price (formerly of the San Francisco Assaying and Refining Works), having fitted up the old Pacific Mail building, No. 524 Sacramento street, corner of Leidesdorff, as an Assay Office and Chemical Laboratory, is now prepared to make assays of the precious and useful metals and their ores, as well as complete or partial analyses of all minerals, salts, waters or other substances that may be desired.

His office will be opened for business on Monday, May 1st, and he hopes that his long residence and experience in his profession will entitle him to a reasonable portion of the business of his friends and the public generally.

PASO ROBLES, CAL., October 18th, 1875.

DEWEY & Co.—Gents: The letters patent for the Tiro Upsetter have come to hand. For the prompt manner with which you have brought the matter to a successful issue, please accept my thanks.

Yours Respectfully, JOHN H. MERTZ.

Machinery.

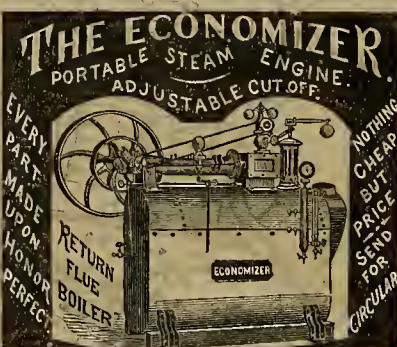
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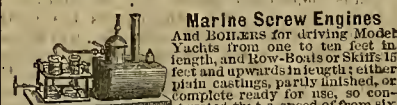
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Yachts from one to ten feet in
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concentration, is open for re-engagement, and would
prefer the task of constructing works for mechanical
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mine, or of remodeling ineffective works in the ore
milling line for successful operation. Apply to
Messrs. DEWEY & CO., of this office, for reference.

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A Quartz Mine and Mill For Sale.

The Mill containing one five stamp battery, free
water power. Sample of rock from the Mine can be
seen at the Mining and Scientific Press office, San
Francisco. Location: Oregon Gulch, near Oroville,
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About thirty or forty tons of Quartz are already ont
and every day am taking out more.

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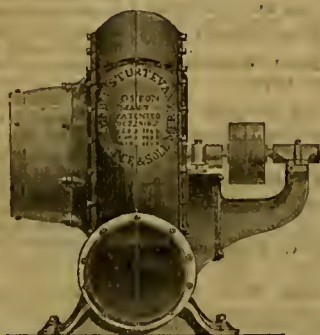
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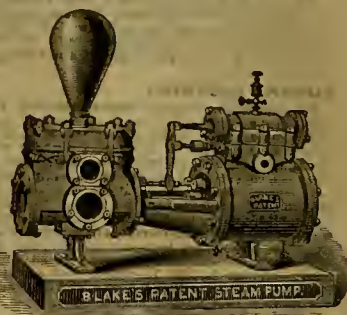
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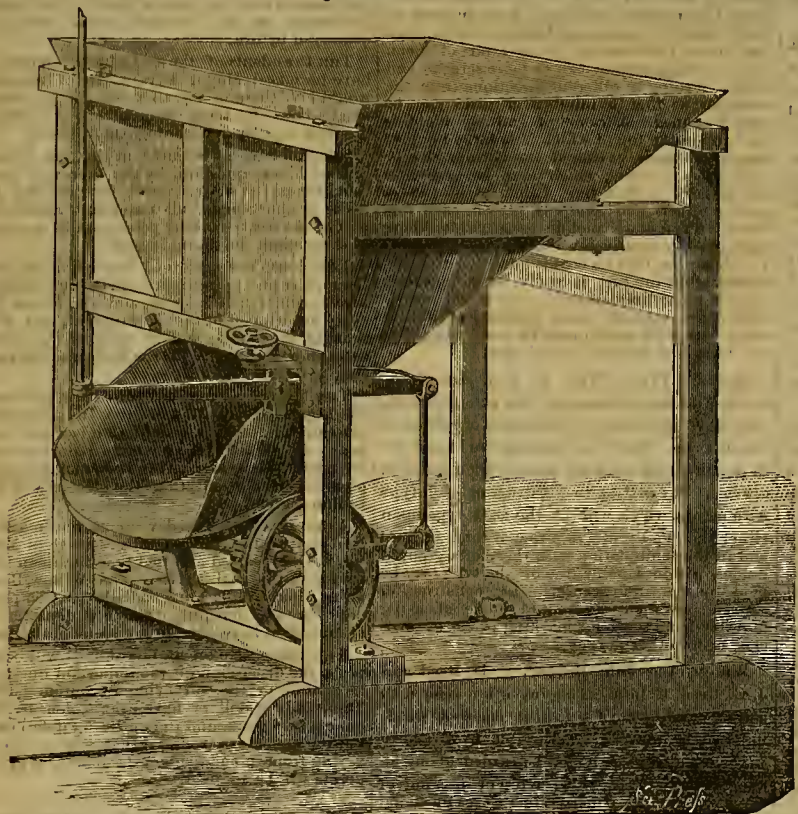
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Over 8,500 in Successful Use in the United
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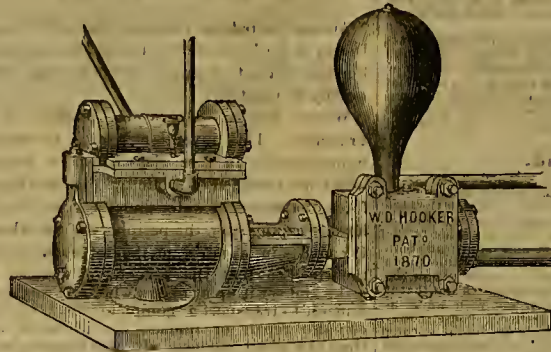
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HENDY & COCHRANE'S ORE-FEEDER, FOR QUARTZ MILLS.



It is confidently believed to be the ne plus ultra of ore-feeders. One of these machines, on exhibition at the late Mechanics' fair, received the premium over all competing feeders. One was recently set up at Schnabel's mill in Newcastle, Placer county, Cal. It very soon showed itself to be the thing wanted; all other feeders under examination were at once rejected, and three more ordered for the same mill. We refer to the following mills using the Cochrane feeders: St. Patrick, Pugh, Green, and Julian, Newcastle, Placer county. Keystone Con. M. Co., Lincoln and Oneida mill, Sutter Creek, Amador county. Tybo Con. M. Co., Nev. For description send for circular. J. HENDY, 32 Fremont Street, San Francisco, Cal., where it can be seen in operation. Also, manufacturer of Hendy's Improved Amalgamator and Concentrator and dealer in Quartz Mill Machinery and Machinists' Tools.

Hooker's Patent Direct Acting Steam Pump.



W. T. GARRATT,
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Sole Proprietor & Manu-
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Coast.

SIMPLE, CHEAP AND
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Adapted for all pur-
poses for which Steam
Pumps are used.
The Best Pump in Use.

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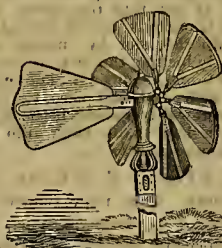
N. B.—Also manufacturer of Hooker's Deep Well and Double-Acting Force Pump. Received the Silver Medal awarded at the last Mechanics' Fair in San Francisco.



G. W. & C. A. LANE, Exeter, N. H., write, Dec. 13:

"We started the heavy 20-inch Corn Mill last Friday you sent to Baldwin & Tabor, Manchester, N. H. We ran it most all day, and ground 60 bushels corn per hour. The mill you sent me at Haverhill, Mass., for A. S. Hook, is doing wonderfully. It is grinding on an average 2,500 lbs. good meal per hour, and has ground 2,800 lbs. in an hour. It is driven by an engine with a 9-in. cylinder, and takes the place of a 30-in. mill of another kind that, when doing its best and loading the engine with all it could carry, only ground 1,500 lbs. per hour. If there is a mill built that can beat that we would be pleased to see it brought out."

AUTOMATIC PUMP.



Raises water by compressed air to any height or distance. Windmill can be set at any distance from the well or spring if required to get a good exposure to the wind.

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Philadelphia, Pa.

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THE MINING AND SCIENTIFIC PRESS is the leading journal of America. New processes and mechanical inventions are illustrated and discussed in its weekly issues. It is a 16-page sheet, handsomely printed, for \$4 per year. Dewey & Co., publishers, San Francisco. —[Mt. Lincoln News, Alma, Colorado.

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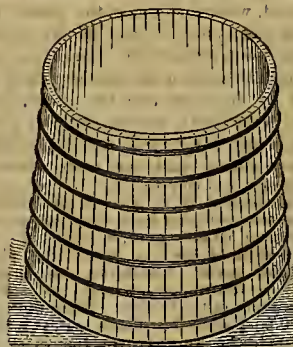
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Mines Bought and Sold.

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Agents for MINING MACHINERY, ENGINES, Etc. and Attorneys for WERNI UNINFLAMMABLE and INDESTRUCTIBLE WOOD PRESERVER.

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WATER TANKS of any capacity, made entirely by machinery. Material the best in use; construction not excelled. Attention, dispatch, satisfaction. Cost less than elsewhere.

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OAKLAND, Saturday, May 13th, 1876
WOODWARD & TAGGART,

Real Estate Auctioneers.

H. A. OOB, AUCTIONEER, WILL SELL AT
PUBLIC AUCTION.

On Saturday, May 13th, 1876, at Salesroom, 460 and 462
Eighth Street, Oakland.

42 Choice Residence Lots,
THE PROPERTY OF CHRISTIAN BAGGE.

This property is situated in a portion of the city that is improving as rapidly as any part of the city; is but a short distance from schools and churches; but four blocks from the Berkeley railroad, which is now being built and will be completed within 30 days. A station is to be built at the foot of Fourteenth street, which will bring this property within 30 minutes of San Francisco. There is not to be found within the city limits more desirable residence sites than this property presents. A horse railroad will soon be built in front of this property, which will bring it within five minutes' ride of Broadway station. Terms, one-fifth cash, one-fifth in one year, one-fifth in two years, one-fifth in three years, one-fifth in four years. Interest on deferred payment at the rate of 10 per cent. per annum. For further particulars, apply to

WOODWARD & TAGGART, 460 and 462
Eighth Street, Oakland.
MAURICE DORE & CO. 326 Pine Street,
San Francisco.

PURCHASERS please say advertised in Scientific Press.

(Continued from page 294.)

CHERRY CREEK DISTRICT.

MINING.—White Pine News, April 29: Joe Potts, from Cherry creek, paid an evening visit yesterday. He is on his way to Eureka to take the foremanship of the Richmond company's mine. Joe is a pioneer White Pine miner, and we have no doubt will give entire satisfaction to his new employers. He gives very flattering information of the mines in and about Cherry creek, and says the time is not far distant when that district will give a good account of itself as a large bullion producer. At present there are about 100 men employed in the different mines, and two mills are kept constantly employed in crushing the ore taken out. In our next issue we will give full particulars of the mining interest at Cherry creek.

EUREKA DISTRICT.

THE RICHMOND COMPANY.—Eureka Sentinel, April 28: We are reliably informed that the Richmond company will resume active operations at the mine on the left proximo. A number of men are already at work underground preparing for the extraction of ore, and as there is a considerable amount at the dump, hauling to the furnace will be resumed at the same time that operations are commenced in the mine. The repairs at the smelting works have not yet been completed, but we presume they will start up at an early period. No trouble is anticipated between the company and the Miners' union. Joe Potts, an experienced miner, formerly foreman for the Eberhardt company, in White Pine, has been engaged as foreman, and will commence the duties of that position next Monday.

WHITE PINE DISTRICT.

GETTING TO WORK.—White Pine News, April 29: During the week we have seen several parties purchasing outfits for a start to the mines. The deep snow having disappeared in many places, the miners will now be able to pack their tools and provisions into the mountains, and start in for a summer's work. The chances for getting to work this season are at least a month earlier than we supposed they would be a month ago, when from three to five feet of snow covered the whole face of the country.

SMELTING.—Harry Strout is making his arrangements to start up smelting at the Metcalf furnace about the 1st of June. He informs us that the amount of ore now out on the dumps is much larger than at this time last spring. We hope he may be successful in his new undertaking, and can see no good reason why he should not be, for all the necessary appliances to successful smelting are here.

Arizona.

POLAND MINE.—Arizona Miner, April 21: Messrs. Roberts and Poland were in town Monday and Tuesday and left with specimens of the ore which they are taking from the Poland mine, some four or five miles above Hitchcock's, on Big Bug. The ore is not of the highest grade, nevertheless gold and silver are both visible to the naked eye, but the value is satisfied if they attach to it consists in the fact that they know the ore to contain mineral in paying quantities and that it is of enormous size and extent, and with walls as plainly defined as those of a plastered house. They have out some 200 tons of smelting ore, and it is their intention as soon as they prove it to a sufficient depth to be absolutely certain that it is inexhaustible to erect reduction works on the site. So far, the value of the mine is Mr. J. M. Roberts that he bought an extension of Mr. Hitchcock on Monday, paying \$500 for it without any development whatever.

Idaho.

ON A PROSPECTING TOUR.—Idaho Avalanche, April 22: Charles Tregakis, George Hammell and Bill Hoffager left this morning for Alturas, and expect to be absent for several months. After reaching Rocky Bar they will strike off into Wood River district, which has never been very closely explored, and spend some time in prospecting for the rich mines that are known to have an existence in that vicinity. Their field of operations for the summer will be in the northern section of the Territory. They have a vast field before them and will traverse a country that must within 20 years become one of the most prolific and promising regions on the Pacific slope.

To know how far the spirit of obstruction is developing itself, we understand that some parties holding claims against the mines are not only demanding full payment of the amounts, but insisting that interest shall be added, commencing with the time they left off work. Truly, the fools and lunatics are not all dead yet.

EARLY THIS AFTERNOON we learned that all or nearly all the outstanding liens on the Illinois Central and Mahogany mines have been heard from and the holders have come out like "little men," determined to surrender them in support of what seems like the most feasible proposition for getting at least a portion of their dues.

ON SATURDAY evening Mr. Wilson, superintendent of the Silver Cord mine, received a telegram from Martin Jones, President of the Silver Cord mining company, in San Francisco, to the effect that owing to the existing condition of affairs, his (Mr. W.'s) services were no longer needed in the capacity of superintendent. This looks as though the companies below were resolved to have no recognized agents in this camp at present, the reason for which, taken in connection with the approach of the term of the district court and the prospect of lien holders' suits, are quite apparent. Further interesting developments may soon be expected.

A LABOR insurrection of those interested in the mining claims here seems to manifest a commendably liberal spirit in coming to the front and making such sacrifices as the emergency demands. Many of them have even offered to surrender claims amounting to several hundred dollars for the benefit of those who still seem to be in doubt about the justice and propriety of accepting the Graham proposition. Such sacrifices are worthy of all praise. Those who make them see that the salvation of the camp depends upon the immediate resumption of work.

Utah.

WEST MOUNTAIN DISTRICT.—Cor. Salt Lake Tribune, April 27: In company with Henry M. May, one of the fortunate owners of the Yosemite mine, we visited that section of West Mountain district, overlooking the valley. In the Yosemite mine the main incline, through which the mine is worked, is down over 400 feet on the ledge, and although worked to the line east and continuing down the line and the prospect of silver—purchased lately—on the west, it has not even "pinched," showing well defined walls in all the workings.

A. G. REMS took us through the new workings of the Winnamuck. The perpendicular shaft is down 240 feet. At the bottom is a pump of a new pattern, which works well, but not powerful enough to master the increasing quantity of water. They are now sinking on the foot wall on an incline, and are down about 30 feet below the bottom of the main shaft. We felt like praying one time when on the cage going down; but knowing that Mr. Etchel manipulated the engine, we concluded to postpone that pious undertaking for another time. This mine, like the Nez Perces, works eight hour shifts. Why it is that mine owners do not adopt this system generally, is surprising.

PATENTS & INVENTIONS.**A Weekly List of U. S. Patents Issued to Pacific Coast Inventors.**

FROM OFFICIAL REPORTS FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.]

By Special Dispatch, Dated Washington, D. C., May 2d, 1876.

FOR WEEK ENDING APRIL 18TH, 1876.*

ROPE GRIPPING DEVICES FOR PROPELLING VEHICLES.—Asa E. Hovey, S. F., Cal.

HOSE COUPLINGS.—George W. Price, S. F., Cal.

TICKET HOLDERS.—William U. Bohm, S. F., Cal.

ORE FEEDERS.—Thomas A. Cochrane and Joshua Hendy, S. F., Cal.

GATE LATCHES.—Henry Jones, Shastu, Cal.

*The patents are not ready for delivery by the Patent Office until some 14 days after the date of issue. NOTE.—Copies of U. S. and Foreign Patents furnished by DEWEY & CO., in the shortest time possible (by telegraph or otherwise) at the lowest rates. All patent business for Pacific coast inventors transacted with perfect security and in the shortest possible time.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency the following are worthy of mention:

WATER WHEEL.—Moses M. Staples, San Francisco. This invention relates to certain improvements in that class of water wheels which are intended to rotate by the centrifugal force of a stream of water under a considerable head, escaping from the periphery of the wheel. It consists in a novel method of constructing the wheel so that the inventor is enabled to make and set it up at places where it would be difficult to transport a complete wheel, and he can also repair or replace the wheel at any time at a small expense. It also consists in a means for regulating the size of the discharge opening so as to proportion it to the amount of water supplied, and keep the wheel full. This wheel may be used with good effect also in driving small machinery, as lathes, sewing machines, etc., by the use of small streams of water having a considerable head.

WINNOM SASH STOP.—W. A. Hawthorn, Carson City, Nevada. This is an improvement on sash fastenings, consisting in the use of a screw and bearing plate, which are attached to the sash, and are capable of being so operated as to secure the sash at any point. Through the side of this sash the inventor makes a hole into which a screw turns. A spring or plate is secured to the edge of this sash, which lies next to the casing, and the point of the screw presses against this plate, one end of which is free. By turning the screw the plate is pressed outward and, presenting a considerable surface, is caused to bind and hold the sash firmly at any point. The plate also prevents any marring of the wood, as might occur if the screw only were used. To secure the sashes firmly when closed, an inclined slot is cut into the side of the casing, and when the sash is closed the plate will be forced into this slot by turning the screw, thus securely locking the sash so that it cannot be opened from the outside. The screw may be provided with a thumb piece, or may have a slot for a screw driver across its head, or he provided with a key shank sunk into the wood so as to be more secure.

LAND GAUGE FOR PLOWS.—E. C. Brown, Antelope, Yolo county. This improvement is called a "lever gauge," by means of which the inventor is able to change the line of draft so as to give the plow more or less land, as required, without stopping the plow. It is seldom that a piece of land of any great extent possesses a surface soil of uniform character. Some places are harder and less easily penetrated by the plow than the others, especially where the land is uneven, so that a plow that is set to turn a furrow of a stated width will at places almost stall the team, while at other places it will run easily. The object of this improvement is to place in the hands of the plowman, whether he is operating a sulky or a common handle plow, a means of regulating the width of the land which the plow turns without having to stop the team, thus regulating the draft upon the team without varying the depth of the furrow. The invention cannot well be described in detail without the aid of engravings. It improves this class of plows, however, as the driver can, by shifting the lever to the right or left, change the landing of the plow without trouble.

TUBULAR CHIMNEYS.—Jeremiah Browell, San Francisco. This invention relates to certain improvements in the construction of chimneys or flues, which are made in sections, and it consists first in constructing the flue or chimney of stone, cement, clay or earthenware tubular blocks or sections, which are perforated longi-

tudinally for the reception of binding rods, and have their ends so formed as to be united in a smoke or gas tight joint. The patent further consists in the formation in these blocks of a series of ventilating flues by which the chimney may be kept cool, or the air which is introduced from the outside may be heated and conveyed to the apartments of the house to heat them if desired. In order to prevent the blocks constituting the chimneys from becoming spread, rings are employed at each of the joints through which the upright rods pass (as described in Mr. Browell's former patent), and the hole is thus bound together and made solid and steady, while of sufficient tightness to be built upwards from any floor without extra support from below. The rings may have projecting extensions to serve as supports, being fastened to beams or cross pieces near the line of the chimney. The flues described will be of special value in kilns, potteries, etc., as the heat from them may be utilized to dry the manufactured articles before they are baked.

COAL RESERVOIR, SCREEN AND SHUTE.—B. C. Satterfield, C. L. Crisman and Jas. McKinley, San Francisco. The patent comprises certain improvements in devices for screening coal, principally when it is discharged from a ship upon a wharf, so that it can be at once assorted and received into vehicles to be carried to its destination. The improvements consist in the formation of a general reservoir, having gates in the bottom, so that the coal may be allowed to fall upon the screens at the time when the carts are ready to receive it and it will thus be perfectly screened, which is not the case when, as in the present machines, it is dumped directly upon the screens and allowed to accumulate there, thus making a reservoir of them. The inventors employ two or more screens and shutes, leading in different directions from the reservoir, so that a number of carts can be loaded at once. A frame of suitable height is used, upon the top of which is a large hopper-shaped reservoir, having at its bottom two or three gates or doors, which may be moved by any suitable mechanism. Below each of these gates a screen and shute is placed, each one leading down at an incline to a point where the carts can be driven up to receive the load. It will be seen that no coal is admitted upon the screens until the cart is ready for it, and thus there is no accumulation of coal which might slide down without being screened at all. A shute without a screen may be used when it is not necessary to separate the coal.

MOVABLE TYPE.—Wm. H. Bell, San Francisco. The improvement in this patent is more especially applicable to that class of rubber or elastic types which are intended for hand use in printing and marking prices upon different articles. It consists in constructing each type with a back which will fit the next type upon either side, and preserve a row of them in line; and in the combination with these of a grooved holder, within which a line of the type may be held for continuous use. This construction gives a convenient and rapid mode of using movable hand type for marking prices of articles, or for other purposes.

WINDMILLS.—John Brower, D. Reed and J. C. Reed, Colusa. This invention relates to certain improvements in that class of windmills which are made adjustable by means of vanes or sails, which can be turned about an axis so as to throw them more or less out of the wind, and it consists in a series of radial arms, which are connected with the vane sections by suitable rods. These radial arms are mounted upon the end of a shaft which passes through the main shaft and has a motion longitudinally, so that it is drawn forward when the wind throws the vane back, and a weight or spring draws it back as the force of the wind decreases.

THE WILLAMETTE WOOLLEN MILLS BURNED.—On Wednesday morning last a fire broke out in the main building of the Willamette woolen manufacturing company's mills, Salem, Oregon, and owing to the building being thoroughly saturated with grease and oil, from long usage, the fire made such rapid headway that before the fire department reached the spot the entire main building was completely wrapped in flames. The buildings comprised the wool house, dry house, office and the main building in which was situated the machinery, each of them being very large and of the best class. They were all destroyed in an incredibly short space of time, and the heat at times was so intense as to prevent the firemen from working to advantage. The loss of the mill, which was one of the most extensive on the coast, is considered a public calamity for Salem, throwing one hundred and eleven men, boys and girls out of employment. No Chinese have ever been employed. The total loss will reach \$150,000; insured for about \$67,500 on the buildings, machinery, wool and goods in process of manufacture.

FIRE AT EMPIRE FOUNDRY.—Last Saturday night a fire was discovered in the pattern shop owned by Dunn & McCune, connected with Savage & Son's Foundry, on Fremont street. The origin is supposed to have been sparks falling on the roof. The fire was speedily extinguished by the department. The loss will be less than a thousand dollars, and is covered by insurance.

General News Items.

COMMODORE VANDARBILT is seriously ill. THE public debt was reduced \$2,780,000 in April.

GENERAL McDOWELL is on his way to California.

A YOUNG lady of this city, disappointed in love, committed suicide last week.

MARK TWAIN appeared successfully on the stage in the "Loan of a Lover," in Hartford, Wednesday.

A SPECIAL from Paris to the New York Herald says Boss Tweed is in the gay French capital.

THE Centennial exhibition will be formally opened to the public Wednesday, May 10th, at noon.

THE revenue officers of this city made a descent on "crooked" whisky houses and distillers on Monday last.

It is considered probable that the Oxford university boat crew will compete in the Philadelphia Centennial regatta.

THE Oregon wagon road company's bill makes slow progress in Congress, there being a strong disinclination to authorize an issue of more land scrip.

SEVERAL bodies of workmen in Paris have asked permission of the Government to open subscriptions for the purpose of sending some of their number to the Centennial exhibition at Philadelphia.

THE citizens of Antioch drove out the Chinese from their town last Monday by ordering them to leave by three o'clock. That night the houses in the Chinese quarter were all destroyed by fire.

THE Presidents of the six Chinese companies have promised Mayor Bryant that if the city would give them a lot they would probably erect a house for those Chinese who are suffering from leprosy and contagious diseases.

SENATOR SARGENT is confident that, in regard to the Chinese question, by the thorough presentation of the subject which he proposes to make to the Senate, all important action as part of the treaty-making power can be secured to accomplish the desired result.

THE House has sustained the action of the Committee on Appropriations in the general and heavy reduction of salaries and employees in every department of the Government, and it is thought the service will be crippled in some cases in consequence, if the bill passes in that shape.

THE House Committee on Appropriations has begun consideration of the Indian appropriation bill. The appropriation last year was nearly \$7,000,000. A very large reduction will be made this year. The reduction is made possible without affecting the efficiency of the Indian service.

ABOUT 2 A. M. Tuesday about ten masked men appeared at the coal mines north of Massillon, Ohio, seized and tied the watchman and set fire to the coal shafts. The Willow Bank mine, Mount Bank mine and Rhodes Company mines are now burning. The fire department of Massillon have gone to the scene of the fire.

THE Committee on Public Lands will soon begin the discussion of the important question in relation to the surveying of public lands. Thousands of dollars have been stolen by dishonest surveyors, and the entire system needs renovating. It is believed that a plan of surveying from monuments established at given points will be adopted.

DESTRUCTIVE FIRE AT POCHE.—About three o'clock Wednesday morning a fire broke out in an unoccupied building. It spread in either direction till a whole block, from Staples' furniture store to Beaupre's brick block, was in flames. It communicated to the west side of Main street, destroying all the buildings between Beaupre's block and Hughes' blacksmith shop. In all, about twenty-five buildings were destroyed. With the exception of the Daily Journal office and Mrs. Hickox's millinery establishment, the houses burned were residences.

THE MINING DETRIMENT QUESTION.—The California Legislature memorial respecting mining detritus has been presented and referred in both branches of Congress to the Committee on Commerce, but the members of the delegation are at a loss what remedy to propose for the difficulty, except the preliminary recommendation necessary for an investigation and report on the subject by the Government engineers.

DURING a recent visit to Sacramento it seemed more pleasant than usual to us in the capital city. Considerable improvement is going on, and business in most branches seemed prosperous and hopeful for the future. We visited the "Holly water works" machinery. "The plant" works well and is a powerful aid to the fire department. Some such system for protection against fire should be adopted in Oakland and other cities in our dry California climate.

WE SHALL SOON publish an illustrated description of the O'Hara chloridizing furnace, of which present information can be had by reference to our advertising columns.

WOODWARD'S GARDENS embraces an Aquarium, Museum, Art Gallery, Conservatories, Tropical Houses, Menagerie, Seal Ponds and Skating Rink.

WOOD AND STRAW BURNING ENGINES.

At prices most economical to customers, at the **SACRAMENTO GLOVE FACTORY OF I. W. Luck**, Tenth St., between J and K Sts., Sacramento. None but the best quality of California tanned skins used. Ladies' and men's colored plain and Indian dressed. Fine and common gloves and mittens on hand, or made to order on short notice. **Send your size or number and you can order by mail. Satisfaction guaranteed.** Ladies, farmers, miners, engineers, and all requiring serviceable gloves are invited to call at the factory.

Columbia District.

A correspondent of the (Nevada) *Silver State* writes from Varyville as follows: Spring has made its appearance, and with it comes a little activity among the prospectors and miners of this district. There has been a

Heavy Fall of Snow

In the mountains in this part of the county this winter, consequently there will be much more water than there was last season; although there has never been a season known but what there has been sufficient water for all mining purposes in this district, and very few mining districts are as much favored as Columbia in regard to water. We have four large running streams in this district that furnish an abundance of power to run all the mills that would be required to crush millions of tons of ore.

The Florence Mill

Has just cleaned up a 50 ton run from the Badger, and obtained a 45 ounce brick, worth \$18.50 per ounce. The entire cost of mining, hauling and milling was \$210, and the mine shows a very large amount of ore of the same quality. Mr. Grant has milled ten tons of ore from his Snow Creek ledge, and it worked very satisfactory. Grant & Co. discovered a short time since a large gold ledge upon the divide southeast of Pine Forest six miles. It is from eight to twelve feet wide, and the gold has the same appearance as that found at Silver City, Idaho—\$8 or \$10 gold—but the ledge is very large, and a large amount of the croppings will go up into the hundreds. They intend commencing work upon it as soon as the snow gets off a little more.

The Independent Company

Are hard at work pushing their shaft down. They have a good three-foot vein. The owners of the Central mine are at work taking out 100 tons of ore to have worked in the Florence mill.

The *Russian River Flag* gives a summary of the quicksilver mining of that county, showing good prospects for the future. There are now about 15 claims in operation, though all do not pay a profit.

WALTER C. STALEY has found placer diggings about 15 miles from the San Fernando tunnel, Los Angeles county. The samples sent to town prove to be scale gold of good quality.

ANOTHER vein of sulphur, the richest yet found, has been discovered at Steamboat. Wheeler & Dean are the owners.

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Salamander Felting Company.



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INDESTRUCTIBLE NON-CONDUCTOR OF HEAT

Saves 15 to 30 per cent. in Fuel.

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Agents for H. W. JOHNS' Patent

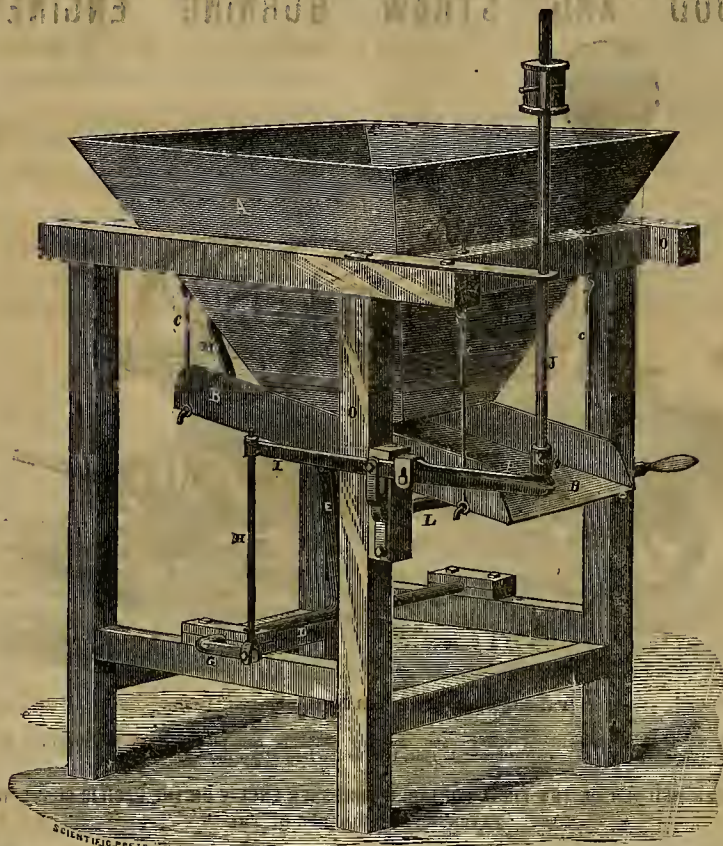
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INDESTRUCTIBLE! SELF-LUBRICATING!

Keefe's Boiler Compound,
Prevents the formation of Scale in Boilers and removes the same, without injuring the iron or causing the water to foam.

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The TULLOCH AUTOMATIC ORE FEEDERS have been practically tested during the last year and a half in twenty-seven mills, of from five to eighty stamps each, and have, in every case, given perfect satisfaction. Refer to the following Mills: California, Con. Virginia, Northern Belle, Leopard, Trench, Humboldt, Douglas, Phoenix, Hite, Crescent, and others. Prices Reduced. Send for Circulars.

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Also manufacture and keep constantly on hand a supply of our

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From Ten (10) to Forty (40) Horse Power.

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Hayes' Improved Steam Pump, Brodie's Improved Crusher, Mining Pumps, Amalgamators, and all kinds of Machinery.

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RAILROAD AND OTHER IRON

Every Variety of Shaiting,

Embracing ALL SIZES of

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Of every description and size.

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Quicksilver Condensers and Furnace Castings.

Sole manufacturers of the Hepburn Roller Pan and Callahan Grate Bars, suitable for Burning Screenings.

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Risdon Iron and Locomotive Works

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Are prepared to make SHEET IRON AND ASPHALTUM PIPE, of any size and for any pressure, and contract to lay the same where wanted, guaranteeing a perfect working pipe with the least amount of material.

Standard sizes of railroad Car Wheels, with special patterns for Mining Cars. These small wheels are made of the best Car Wheel Iron, properly chilled, and can be fitted up with the improved axle and box—introduced by this company, and guaranteed to outlast any other wheels made in this State.

All kinds of Machinery made and repaired.

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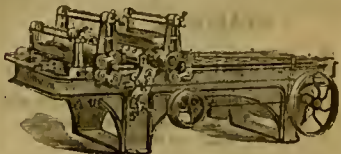
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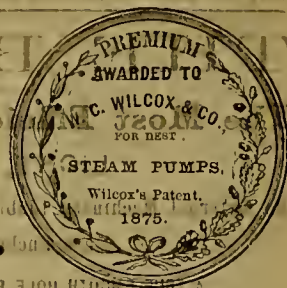
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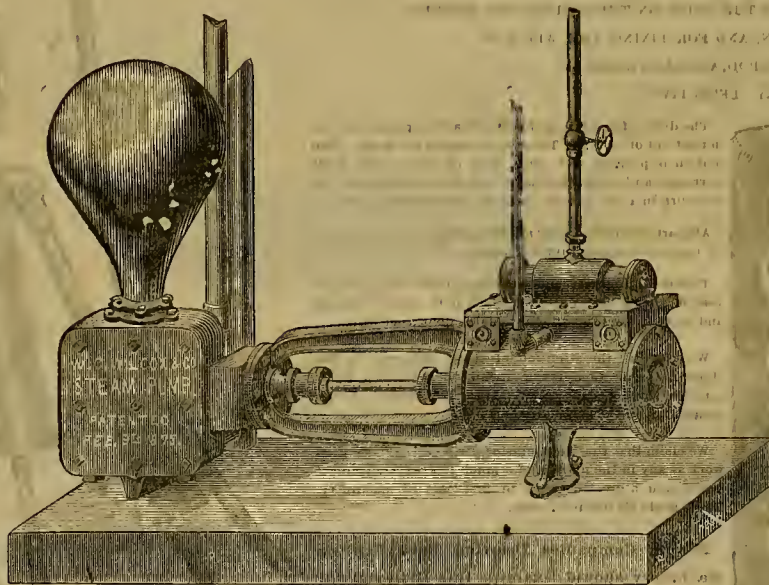
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THE MINING AND SCIENTIFIC PRESS is one of the best papers published on this coast. It should be in the hands of every miner and mechanic in the State. The issue of last week contained an excellent article on the old product of this coast.—Oroville Mercury, Jan. 28.

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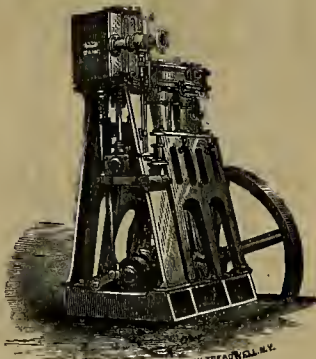
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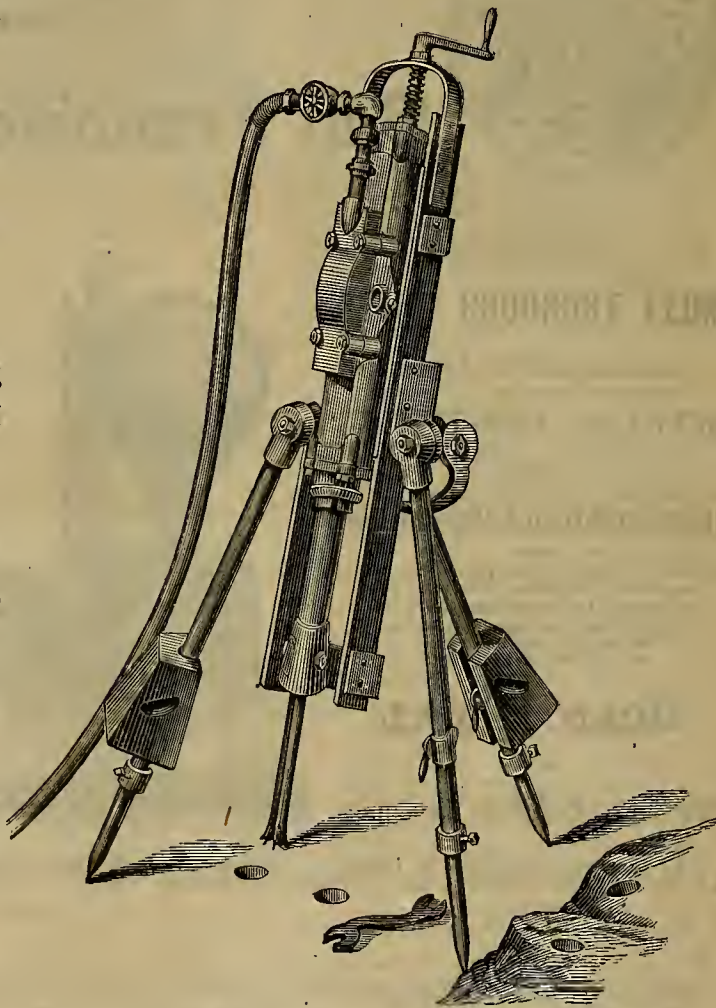
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SAN FRANCISCO, SATURDAY, MAY 13, 1876.

VOLUME XXVII
Number 20.

Volatility of Gold and Silver.

[By ALMARIN B. PAUL.]

As more attention than heretofore is being given to the roasting and calcining of ores, and as questions relative to the volatility of gold and silver have been so often asked, I have thought some data on the subject might be interesting to your readers.

In the minds of many, the idea that gold and silver can be passed off as a vapor is regarded as preposterous, and that over \$100,000 could go "up the chimney" of our San Francisco mint was hooted at, but when the sweeping of roofs in the vicinity all around showed gold, the question naturally came up as to where it came from if not the mint.

The fact that metals at high temperature do vaporize is so clearly settled by experiment that to doubt is simply exhibiting a lack of knowledge upon the subject. It has been conclusively shown that gold melted at the temperature of an ordinary furnace suffers some loss, and the more volatile are the metals with which it is associated, the greater is the percentage.

Silver suffers more than gold, and often to a very serious extent. In one experiment I made where silver was associated with lead, arsenic and antimony, over one-half the value passed off in vapor.

Some years ago, in Utah, at one of the furnaces quite an excitement was brought about in consequence of so serious a loss that the employees were charged with embezzlement, but all protesting against the charge and giving it as their opinion that it passed off as vapor, an investigation was instituted, which resulted in determining this to be the fact. Exactly what was the loss I do not remember, but it was very large. This discovery was the result of careful assays as to the value of ores before submitting them to the furnace and seeing the results afterwards.

Every one who has worked reverberatory furnaces know that the roofs of them become coated with the smoke of gold (if I may be allowed to use such an expression), especially in the roasting of sulphurets. The amount of gold carried off is not known—our mining men generally accepting Shakespeare's motto: "He who knoweth not what is lost loses nothing." Bricks of these furnaces, to a given distance, become saturated with this vaporized gold.

In chloridizing silver ores there is in part an arrest, in consequence of a change of conditions; still a certain loss is inevitable, especially if antimony or arsenic is present. And what this loss is our miners have given but little attention to ascertaining. All the Mexican vases show silver at the crown of their chimneys, and in no small quantities after a long run. But I will drop our home experiments and facts, as they may not have the same weight as views of men higher in rank than your humble servant.

St. Clair Deville showed by his experiments that with the oxyhydrogen blast he could vaporize gold just as zinc or mercury are distilled.

It was found also "that when gold was melted in the focus of the great Italian burning glass, that it fumed away in vapor, and that a silver ball held in contact with the vapor was palpably gilt." It has also been determined that the purple of an inverted cupel, when used in an assay of gold, is gold.

Napier gave considerable time to the investigation of this subject of vaporization of the precious metals, and his experiments were exhaustive and conclusive. Without going into too lengthy an account of the results of his experiments, I will cite only two. An examination of the flue leading from a furnace to the stack, and a distance of 700 feet, was as follows:

	Lead.	Silver.	
	Oz.	Owt.	Gr.
100 feet distance from furnace, 65 per cent.	61	2	8
200 "	46	2	8
300 "	46	2	17
400 "	64	2	1
500 "	64	3	6
600 "	58	1	12
700 "	62	2	17
Foot of Chimney,	66	3	8

An examination of a chimney showed as follows:

	Top.	Middle.	Bottom.
Metallic Silver.....	29,280	39,169	48,750
Oxide of Silver.....	1,964	3,140	682
Gold.....	2,120	2,600	4,200
Total Grains.....	33,464	44,909	53,632

From the flues of one of the large melting

establishments of Australia it was positively ascertained that for every pound of metal which passed through the process of melting, there was a loss by vaporization of 14,760 grains. The dust from the shaft showed for every pound 29.54 grains of silver, and 14.12 grains of gold, giving a total of 43.66 per pound.

If so much attaches itself, in its ascent, how much must pass off out of the chimney?



Fig. 1. Sectional Side Elevation of Furnace.

All this gold and silver is simply a mist, which cannot be detected by washing or by the eye except with a glass of 100 diameters. I could extend this further, but what is the use? I simply desire to present facts, that our mining men may not build too hot a fire around their hopes, for fear it might end in smoke and pass up the chimney; and to show that the absolute destruction of base metals without a loss of the precious is a demonstrated impossibility.

The chloridizing of silver ores by careful

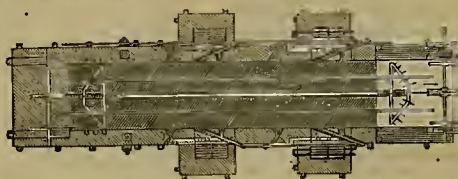


Fig. 2. Bottom Hearth of 50 Ton Furnace.

manipulation is practically profitable and correct, and the calcining of ores by simple furnaces at a moderate heat in order to dry and to soften the ore, whereby it can be moved cheaply reduced, I have long been an advocate of, and I am glad to see that California quartz miners are beginning to think well of it.

As mining is getting to be a pursuit of some magnitude, all these questions must be considered, investigated and experimented upon,

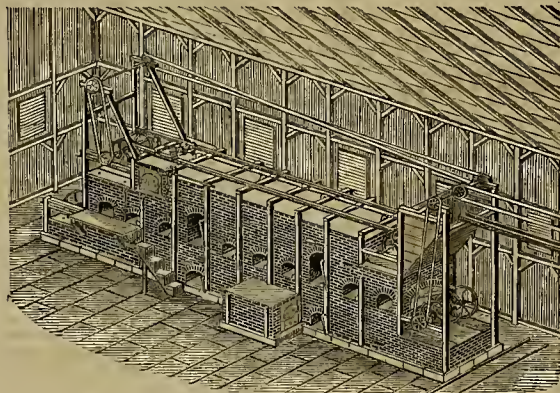


Fig. 3. The O'Harra Chloridizing Furnace.

and facts should be thrown forth to the public for our mutual good.

The Helena, Montana, Independent claims that by building a railroad from that city to the head of navigation on the Missouri river, freight can be laid down there at less cost than Salt Lake pays for freight, not exceeding two and a quarter cents.

It is asserted that the gold now being exhibited as coming from the Black hills is mostly procured from Montana, Colorado, and other points, to be used for advertising purposes.

The O'Harra Chloridizing Furnace.

We give on this page illustrations of the O'Harra chloridizing furnace, one of which is now in successful operation at the Consolidated Poe mine, in Nevada. Fig. 1 is a sectional side elevation; Fig. 2 a plan or view of bottom hearth; and Fig. 3 a perspective

view of the furnace. We take from the Nevada State Journal the following description of the furnace, together with several important items about this new mode of treating Peavine ore:

"The ore of the Consolidated Poe mine is crushed through a ten stamp dry battery, from whence it is elevated continuously as it discharges from the battery to a large hopper, from which it feeds into the O'Harra Cham-

creases, and is then moved back to the end of the furnace through the flames of the two fires, and after passing the last fire it is still moved and turned over a space of fifteen feet on a cooling hearth and is discharged into the ear cool and ready for the amalgamating process. There are no chemicals used in the ore but chloride of sodium (salt).

"When the ore gets under a low heat the antimony commences to burn the lead, antimony, zinc, iron, copper and other base metals, changes to a sulphate, caused by the superheated steam playing through the flames and oxygen from the atmosphere. When the ore falls to the lower hearth the most of the base metals are oxidized, while the silver remains as a sulphate. Now from five to eight per cent. of salt is fed into the ore from a hopper that discharges about a pound every time the plows pass along. The ore being under an increased heat with the oxygen from the atmosphere mixing with the flames caused by the draft and also superheated steam, causes chemical changes to take place and thereby changes the silver and gold to a chloride. The sulphates decompose; the sulphur, liberated, unites with oxygen and hydrogen, creating sulphuric acid, which attacks the salt, decomposes it and liberates the chlorine gas from the soda; silver, having a strong chemical affinity for chlorine, takes up a portion and is converted into a chloride of silver, which is easily amalgamated when brought in contact with mercury in an iron pan.

"The ore of the Consolidated Poe, and in fact all the ores in the district, are of a very rebellious nature, and have been found very difficult to work, but it is found of late that the O'Harra furnace will work the ore up to 90 per cent. These ores are the most complicated chemical compounds to be found in Nature's laboratory. The ore is from 30 to 90 per cent. metal, with hardly any gangues such as quartz or spar, but in fact is made up of antimony, lead, tin, zinc, cobalt, nickel, iron and copper, with silver and a very little gold and a large per cent. of sulphur and arsenic. The chemical analysis proves it to be argentiferous silver fahl ore, argentiferous gray copper ore, miargyrite, stromeyerite, zinc blende, iron pyrites, sulphide of antimony, and arsenic with sulphurets of silver and silver held in all the other compounds. The ore pays from \$20 up to \$300 per ton. Argentiferous fahl ore is a chemical compound—copper, antimony, arsenic, sulphur, lead, iron, zinc, silver and sometimes gold and quicksilver. Miargyrite is sulphuret of silver and antimony. Stromeyerite is a sulphuret of silver and copper. Zinc blende is a sulphuret of zinc and silver."

The furnace is guaranteed to chloridize from 85 to 95 per cent. of any gold or silver ore that are not more profitable for smelting. It will also desulphurize ores and put them in proper shape for working in cupola furnaces. The cost of roasting and chloridizing by this process is stated at \$2.93 1/2 per ton, and in a furnace of three times the capacity, the cost is decreased twenty per cent. By reference to our advertising columns the details of cost may be noted as well as the address of the inventor.

THE MINERS' STRIKE.—There is much excitement at Massillon, Ohio, over the miners' strike. The green hands are working under the protection of the militia. Two companies of soldiers have been ordered there from Sandosky. The Herald's Massillon special says: Governor Hayes has written to Adjutant-General Wickhoff, expressing fear that the present force at Massillon would prove insufficient should there be any further disturbances in the mining districts. He further instructs him to take every precaution, and to have it thoroughly understood that the militia will remain until the lawlessness is effectually quelled. The Adjutant-General has summoned two more companies, who will arrive to night. The Grand Jury has found numerous indictments against partisans in the recent riots at the Farmington mine, but as yet no arrests have been made.

MR. A. C. KNOX.—We are pleased to say that this gentleman, who has been connected with our office more than ten years, is now on a corresponding and business tour to El Dorado county, with the intention of journeying northward. He has our entire confidence.

At the University.

On a bright day of last week we passed a few hours at the Stats University, on a flying visit to Prof. W. B. Rising, professor of chemistry. With Prof. Rising we made a call upon Prof. Hilgard, with whose name our readers are familiar from his favors to the Press. We took a look through the items of agricultural work which Prof. Hilgard is prosecuting, and we were pleased to notice the spirit of intelligent activity which characterizes his efforts. Of course, as all understand, the late lamented Legislature put the departments of the University on very short commons, and all enterprises are restricted, but there is apparent a commendable disposition to do as much as possible within the legitimate revenues of the University.

Soil Analysis.

In his laboratory Prof. Hilgard is just now doing actual work upon questions submitted to him by the farmers of the State. We printed not long ago an analysis of an alkali soil from Sherman island, furnished by one of our correspondents, and this week we print a report upon another soil specimen from Los Angeles county. We regard this work of especial interest and value. In the absence of a complete survey of the State, from which could be learned the characteristics of the different soils, there is a way open by which the farmer may gain, at the State expense, many useful hints concerning the soil he is cultivating, and that is by applying at the agricultural department of the University.

Prof. Hilgard has had long experience in the analysis of soils and maintains its practical value. He does not advocate the practical value of an ultimate analysis, but claims, as we believe truly, that by determining the available plant food which exists in any soil, taking into account the conditions of situation and mode of tillage, there can be gained a knowledge of what can be profitably added to the soil, which subsequent practice will prove true and trustworthy. We are glad to know that our readers are taking steps to ascertain what use can be made of University science in their operations.

In securing data for determining the physical characteristics of different soils, Prof. Hilgard employs an apparatus in which water is forced through the soil at different pressures. At first the moist minute particles are driven over the top of the receptacle into a receiver, whence they can be taken for weighing. The pressure of water is then increased and the next lightest particles are forced over for weighing, and so on with different pressures until all the particles of soil are separated into their specific classes. The Professor has introduced a most valuable improvement to this apparatus, in the shape of a beater which churns the particles as the water is passing through them, preventing the current from carrying over any flocculent masses and compelling each mechanical division of the sample to wait its pressure which is requisite to send over its class of particles. This apparatus accomplishes in a short time what would otherwise be a most laborious undertaking. We saw a specimen of its work in the separation which had been made of the particles of the Los Angeles alkali soil of which an analysis is given elsewhere this week. At least a dozen divisions of the soil had been made in respect to the size of the particles composing it. Of course this definite knowledge of the physical nature of a soil is invaluable in determining its physical properties, viz.: absorptive, adhesive, retentive and other powers.

Home Made Chemicals.

We were much interested in examining the laboratories to note that apparatus has lately been introduced for producing chemically pure acids and ammonia from the cheap commercial articles. Thus the chief materials for Profs. Rising's and Hilgard's laboratories are secured at but a fraction of the price demanded for pure chemicals by the manufacturers, and in addition to this saving of expense the chemical students gain a better insight into practical chemical manufacture than they could from the smaller distillations of the analytical laboratory.

The Propagating Department.

In the propagating department, which is under the immediate supervision of our contributor, Mr. John Ellis, the horticulturist, we found evidence of very successful work. His plants have been propagated with great care and most successfully, as the green rows of scions testify. He has material enough not only to add greatly to the beauty of the grounds, but also to make valuable tests of useful plants under various conditions; but the work in this useful department will be much restricted because of a lack of funds.

During our visit we found the gentlemen of the agricultural department ready to give us all the information desired concerning the work they have in hand and expressing an earnest desire to do everything in their power to minister to the progress of agriculture in our State. We trust that our readers will not hesitate to test the quality of the agricultural department when any point in their work requires or invites such light as scientific men can cast upon it.

The most deplorable and disgusting feature of the Black hills excitement, says the Denver News, is the efforts of the parties who are coining money out of the folly of the victims of the furore to lure them on by systematic false representations. Cheyenne, Omaha, Sioux City and other outfitting points are especially culpable in this respect.

Mining Suits.

A suit has been brought in the Twelfth district court by Edward C. Lovell *et al* against Thomas Seale, B. B. Minor, H. W. Vaughn, H. W. Sesle and William Jacobs, directors of the "63 gold and silver mining company," for alleged fraudulent mismanagement of a mine owned by the company and in which Lovell and others were shareholders. The plaintiffs allege that Thomas Seale obtained his election as president of the company by fraudulent means and by threatening to deprive one Riley, a former superintendent of the mine and owner of 14,000 shares of stock, of his interest in the mine in case of a refusal, induced him to lend his aid in securing the full control of the company to said Thomas Seale. He then managed the mine, it is alleged, in such a manner as to cause loss to the stockholders, and appropriated money paid into the company on assessments. William Sibley also files a complaint against the same parties, praying for an injunction restraining them from selling 14,000 shares belonging to plaintiff and held by defendants for assessments alleged to have been illegally levied. Plaintiff prays that said directors may be removed and the books and papers of the company turned over to the shareholders.

In the Fourth district court last week the suit of James Smith *et al* against the New England tunnel and smelting company was on trial. This action is to have declared null and void the transfer of 12,000 shares of the capital stock of the company on April 21st, 1876, to J. D. Thompson, of the firm of Stacy, Thompson & Hart, and that such of the defendants as now hold the shares be required to transfer them back to the company. That the defendants, D. K. Tripp, James Morgan, William Stewart, George W. Brown, J. J. Green, A. C. Hammond, John S. Stacy, J. D. Thompson, William H. H. Hart and C. C. Tripp, or either of them, who may hold any stock of the company, in trust for the same, be ordered to transfer the stock back to the company; that the company be ordered not to convey any of its capital stock to any person without the consent of a majority or all of the stockholders; that in the meantime a temporary order of injunction be issued, restraining the defendants from transferring or in any other way disposing of any of the stock of the company which they may hold in trust for the company, and in particular from disposing of 37,000 shares which were purchased by the company at the assessment sale on the 13th of April, 1876, other than a transfer of such stock as the plaintiffs may consent to; also, that the defendant, C. C. Tripp, be enjoined from voting at any and all meetings of the stockholders of the company by means of the transfer of certain stock to himself without authority from the stockholders. The capital stock of the company is \$10,000,000, divided into 100,000 shares of \$100 each. Only 63,000 shares have been subscribed for and are held by bona fide stockholders, which the plaintiffs claim to be.

James G. Fair on the Silver Question.

During James G. Fair's recent visit to the East he was overhauled by the ubiquitous interviewer, and this is what he was made to say:

Reporter.—As you have doubtless given the matter much thought, what are your views as to the future value of silver as it relates to gold?

Mr. Fair.—Silver has declined very considerably; in fact, for a time was unduly depressed, touching as low as 52 pence in London, but has quite recently advanced to 54. I think that there need be no aerious apprehension of further depreciation, and the difference will doubtless continue about as at present, say 16 to 1. While the production is rapidly increasing in this country, that in the rest of the world is falling off. The statistics for 1875 show a decrease in the entire production of over \$11,000,000 as compared with 1874. Silver is a good article to buy on speculation when as low as 53.

Reporter.—From what quarter do you expect a demand sufficient to absorb this immense production of silver?

Mr. Fair.—A somewhat erroneous impression gets abroad about our mines being all silver. It is true they are called "silver mines," while, in fact, the product contains in value from 46 to 50 per cent. of gold. In making our exchanges we get the value of the gold in gold coin, and for the silver we receive gold also: if the market for silver is 53½d we get about \$118½ gold. Our daily transactions on the coast are almost all in silver, and yours soon will be; it will require \$50,000,000 to redeem these little rags [holding up a ten-cent shin-plester], which you people call money. China and Japan, and other countries in that direction, will continue to take a large amount, while some parts of Continental Europe will use it as heretofore. In Austria it is a legal tender, and their Government loans are made payable in silver. The trade dollar, containing 420 grains of pure silver, will go hence, while the standard American dollar, with only 412½, and the halves and quarters, with 387, will enter into general circulation, taking the place, as I before remarked, of these rags. This large production will of itself stimulate the use of it in various ways aside from a circulating medium.

Coinage at the Mint.

There were 1,876,000 pieces coined at the mint in this city last month, of which 1,737,000 were in silver and 139,000 in gold. The descriptions compare as follows with the same month last year:

	1875.	1876.
Double Eagles.....	\$2,560,000	\$2,780,000
Trade Dollars.....	652,000	385,000
Half Dollars.....	229,000	15,000
Quarter Dollars.....		128,000
Dimes.....	17,000	81,000

Totals.....\$3,458,000 \$3,389,000

For the corresponding month of 1874 the amount was \$1,752,000, against \$1,332,000 in 1873. Most of the double eagles made last month were shipped to the East, the total exports of that coin amounting to \$1,859,800. This is the first month in some time that the coinage of the trade dollar was less than the exports, the shipments being \$691,406. The subsidiary silver coin was for the Department at Washington, and there are large orders ahead for the same account, which will employ all the time of the operatives during the remainder of the fiscal year. The business for the past ten months has been as follows:

	Gold.	Silver.	Total.
1875-76.			
July.....	\$1,780,000	\$ 728,000	\$2,508,000
August.....	3,840,000	670,000	4,510,000
September.....	2,740,000	674,000	3,414,000
October.....	2,440,000	678,000	3,118,000
November.....	1,820,000	803,000	2,623,000
December.....	1,920,000	800,000	2,720,000
January.....	1,940,000	617,000	2,557,000
February.....	2,352,500	780,000	3,132,500
March.....	2,280,000	1,028,000	3,308,000
April.....	2,780,000	609,000	3,389,000

Totals.....\$23,236,500 \$7,287,000 \$30,523,500

The gold coinage includes \$50,000 in eagles in February, \$45,000 in half eagles in September and March, and \$41,500 in quarter eagles in September and February. The silver coinage embraces \$4,082,000 in trade dollars for export, and the remainder in half dollars, quarter dollars, double dimes and dimes for the Atlantic States. The coinage for the current fiscal year is the largest in the history of the mint. For the same time in 1874-75 the total was \$26,622,000, or \$4,000,000 less than this year, of which \$23,320,000 was in gold and \$3,302,000 in silver. The descriptions for each year compare as follows for the period under review:

	1874-75.	1875-76.
Double Eagles.....	\$23,215,000	\$23,100,000
Eagles.....	50,000	50,000
Half Eagles.....	55,000	45,000
Quarter Eagles.....		41,500
Trade Dollars.....	2,619,000	4,082,000
Half Dollars.....	458,000	1,217,000
Quarter Dollars.....		128,000
Double Dimes.....		227,000
Dimes.....	197,000	1,351,000

Totals.....\$26,622,000 \$30,523,500

The coinage of trade dollars was intercepted none too soon. The country was being over-run with this stamped bullion, worth 10 per cent. discount in the open market, and yet forced on the community in large quantities at par. It was fast driving gold from all channels of circulation, which this unlimited manufacture of any kind of silver coins must eventually do. We hope therefore that we have seen the last of coinage for private account. There is enough work for the mints for a year to come in providing subsidiary silver coin for use in the Atlantic States, which ought to be limited to the amount of fractional currency withdrawn from circulation.

ORIGINAL COMSTOCK.—This is one of the oldest locations in the Gold Canon section, or in fact on the Comstock lode, being made by the famous Comstock himself, and the ninth location recorded in the Territory. It is to the westward of the Silver Hill mine, and very good developments were made in the early times, but not being properly worked or managed, it fell into obscurity and has laid idle till now, when it has got into the hands of men of capital and energy, who propose developing its real merits. Work is resumed upon it in the most practical manner. A tunnel has been started into the hill at a point which will cause it to intersect the ledge very shortly and follow it. This tunnel will develop the ledge to the depth of over 200 feet. A fine working shaft of three compartments is also started east of the ledge to open the mine at a much greater depth.—*Gold Hill News.*

NOTHING can prevent great loss to property in Salt Lake City by high water this spring. Every day increases the streams from the mountains, and the snow has just begun to melt. The banks of the canal along the western portion of the city have broken in a number of places and most of the farms and lots are covered with from a few inches to two feet of water. The lower part of the Fifth ward is a lake. Several houses are surrounded, the inhabitants being unable to leave their residences except in boats. There is no way to prevent the overflow, as the canals and waste ditches are not sufficient to carry off the flood.

THE C. & C. SHAFT.—Sinking the new shaft of the Consolidated Virginia and California mines is going steadily forward, the bottom still in porphyry, and the flow of water continuing at the rate of 40 inches. This water furnishes a great impediment to the rate of sinking, and must continue to do so until the flow is drained. This delay of the sinking must at the present rate of speed necessarily create a delay of nearly three months in the completion of the connection between the shaft and the 1500-foot level of the two mines. Otherwise everything is working as well as it is possible.

Butte County Mines.

Heretofore we have called the attention of our readers, says the Oroville Mercury, to the mines in the hills, at some distance from the town of Oroville. New companies have been formed, new mines opened, and new interests have been developed in those parts of the county, that we could not afford to let pass unnoticed. But now another enterprise has been started right here at home under our nose, and on ground almost classic, as it is well known to miners all over the State, who once had their home in this place but are now scattered. Just west of the depot, about a dozen rods, is a claim comprising some thirty-seven and a half acres, owned by E. P. Farnham, F. W. Day, George Miller, and Michael Lout. In an early day the ground was covered with cabins and the surface skimmed over. Later it was leased to Chinamen, who mined down some thirty feet, through three layers of pay dirt. This was as far as the company would allow them to sink. That the ground was rich and paid well as far down as the Chinamen were allowed to work, we need only state that for a small piece of the ground the Chinamen have paid the past winter the sum of \$2,100 in gold coin. This, only for the privilege of working down some thirty feet. Those who have lived here since the first mining begun, say that not less than \$2,000,000 have been taken out of this claim, and yet very little of it has been worked; only the top skimmed over. But the company is now going to mine it thoroughly. The bed-rock lays at a depth of 150 feet. Some years ago a shaft was sunk 120 feet and blue gravel and decomposed wood found with the richest of prospects, but the water drove the miners out. A competent engineer has been upon the ground, and informs the owners that he will put up a twelve-horse power engine and pump to match it, and will guarantee to keep the shaft dry to the bedrock. His offer has been accepted, and in a very short time the company will begin the work of sinking a shaft, four by eight feet, planked with heavy timber, and push the work both night and day, with three shifts of men working eight hours each, until the bottom is reached. They think bottom can be reached in forty or fifty days, after everything is in readiness. When once down drifts will be run and the dirt brought to the surface and sluiced off. There is no one who is at all acquainted with the ground but has the utmost confidence in it, and believes that each one of the company has a fortune in it. The only wonder is that some one has not undertaken it before, instead of going to distant places where a fortune has to be spent before any returns can be had. Here \$3,000 will cover all expenses up to the time of reaching the bedrock. We shall closely watch this enterprise and occasionally give our readers the result of what has been done.

Borax Lake.

The Coso Mining News says: Mr. D. Searles came in last Thursday from Borax lake, where are located his extensive works for the manufacture of borax. The lake is situated in Panamint valley, some 39 miles south from this place. The works are turning out 90 to 100 tons of refined borax per month. There are now on hand 4,000 sacks ready for shipment, the sacks averaging 85 pounds each. Mr. Searles says that George Hearst and others are working some very fine mines right across the valley from the borax works, in the Panamint range, and they have now on their dumps some 15 tons of high grade ore, going from \$1,000 to \$2,000 in silver. The ore is fine milling, being freely interspersed with horn silver. This is an old district known as the "Slate Range," and the mine now being worked is the old Antim, which in 1862 sold as high as \$100 per foot. The mine is relocated by Hearst, Reese and Hagin, of San Francisco, and is now called the Alta. A tunnel has been run in on the Alta some 300 feet, which brings them below the surface 75 feet; and at the face of the tunnel a winze has been sunk to a depth of 30 feet, good ore being found for the entire depth. The vein in the tunnel is 18 inches in width, but at the bottom of the winze it is two feet in width. On the Francis, Morrow and San Francisco ledges, a series of ledges one above the other in the hill, a tunnel has been run 600 feet, and it is thought the first ledge will be struck in about 20 feet further, which will bring them to a depth of 400 feet. The three ledges lie one above the other and 150 to 200 feet apart, so that when the tunnel shall have reached the second ledge it will be at a depth of about 550 feet, and the third about 700 feet. On the Lake View a tunnel has been run in about 100 feet, and some 25 feet further is yet to run to strike the ledge. Some six tons of ore have been taken out from the incline on the ledge, which was sent to San Francisco for reduction, yielding \$1,100 per ton. The four last mentioned claims are the property of Searles Bros., Skilling & Graesard. These were the old original locations made in the fall of 1861, the parties locating them having held possession and kept two or three men to work all the time developing them. Some three miles below the Searles Brothers' works are other works being run by Theophilus Dodge for an English company, Arthur Robottom being at its head. He employs five Chinamen and four white men. The Searles Brothers employ 26 Chinamen and 16 white men. Mr. Dodge started his works last November, and are now just getting in shape to crystallize. They have made no shipments as yet.

MECHANICAL PROGRESS.

Mechanical Specialties for the Centennial.

We find several notes in our Eastern exchanges of interesting mechanical works which are being accomplished especially for the display at Philadelphia. We describe a few of these as follows:

Bridges.

The Keystone bridge company will send to the exhibition the longest span weldless chord links for bridges ever made in this country; specimens of wrought iron tubular columns; a model on the scale of half an inch to the foot, of a Raritan trestle bridge, 472 feet span. The model is 21 feet long—nickel plated, showing all the details of construction of the trusses, central drum, and bearing wheels, and the engine, bailer, gearing and hydraulic machinery for operating and elevating the bridge. Also photographs of the St. Louis bridge, 520 feet span, and the machinery, cables, etc., used by the Keystone bridge company in erecting the arches, with a full size actual joint of arch and all its connections as used in the bridge. Also photographs of channel spans, Cincinnati, 420 feet and 520 feet spans. Photographs of Ohio river bridges at Piquetsburg, 350 feet span, Bellaire, 350 feet span, Fairmont, 348 feet span, and many other long span bridges erected by the company over the Mississippi river and in the Eastern States.

Shop Boys' Locomotive.

A locomotive is being built by the apprentice boys in the Philadelphia and Reading railroad shops, at Reading, the whole work being done under the direction of a young man who has not yet served his entire time with the company. It is a heavy ten wheel draft engine, cylinder 18x22 inches, and as it is to be built for exhibition at the Centennial, every part of the locomotive is receiving an extra finish. The casting and frame work are well scraped, the latter being finished on both sides. All brass work is to receive a high polish and finish. The main and parallel rods are to be bright, and the cab is to be of passenger finish and extra painted. Sprig hangers, equalizing beams, bolt heads and nuts are all to be milled off and finished with the greatest of care.

Steel Works.

The Baldwin *Taken of Progress*, says: On Monday, the 27th inst., the Pennsylvania steel company cast the largest steel ingot ever molded in this country, and equal to any made in England. The ingot is 10 feet long, and has 29 inches square section. Its solid contents is 100,000 cubic inches, and its weight 25,000 pounds. This mass will be sent to the Centennial exhibition, either in its present form, or will be forged into a shaft under the company's 14 ton hammer. The *Pittsburg Dispatch*, of April 15th, says: The Edgar Thomson works rolled this morning what, considering its weight, is claimed to be the longest steel rail in the world. It measures 120 feet, weighs 62 pounds per yard, and it is a perfect rail in every respect. Another rail, 96 feet long, was rolled. Both are for the Centennial.

Coal.

The Philadelphia *Bulletin* says: The Kitzing coal company have now on the Centennial grounds, ready to be placed in position, the largest specimen of bituminous coal ever taken from the mines. There are two blocks, both taken from the Franklin colliery, in Clearfield county. The smaller of these blocks weighs a little over two and one-fourth tons, and the larger will balance at about five tons. These immense masses of coal have been taken out the full height of the measure, and one can scarcely conceive the immense amount of labor and ingenuity required to place them on the cars ready for transmission. It was found impracticable to get the larger lump on the truck, and it became necessary to improvise a flat boat by which it could be dragged over the rails. The mass having been first strongly secured with iron bands and strong oak plank, was gradually worked upon the boat or flat, and six heavy mules attached. Their united force was, however, unable to move the immense weight, and at last a block and tackle was procured, by which the coal was gradually drawn out from the mine.

A LIGHTNING BOX MACHINE.—The following is a description of a box machine which turns out boxes directly from the paper pulp. The inventor is from Sherbrook, Canada. The pulp, when prepared, is received into a hollow cylinder, where it assumes the box form; it passes thence into a press, where its whole interior and exterior surface is subjected to a pressure of four tons to the square inch. From the press it comes out firm and hard as the best cardboard, but still damp; it is put into a drying rack and completely dried; then it is carried to a finishing machine, which, by further pressure, finishes it in any desired style, plain or embossed. The latter process is executed by the machine without outside attendance, and does not add to the expense of the box. From the moment the pulp leaves the "pulp engine" to the moment when the box is ready to be dried, the whole of the work is done automatically, without being touched by a workman's hand. In the whole operation of converting the pulp into the box ready for sale, only two boys or girls are employed—the one

to arrange the damp boxes in the drying rack, the other to feed them to the finishing machine. Collar boxes, four inches in diameter, and two and one-half inches in depth are turned out at the rate of 350 an hour.

AMERICAN MACHINERY FOR SIBERIA.—We are indebted to the St. Louis *Commercial Gazette* for the following interesting information: A St. Louis firm, Gerard B. Allen & Co., recently shipped 10 carloads of machinery via the St. Louis, Kansas City and Northern, Kansas City and Council Bluffs and Central Pacific railroads for San Francisco, from whence it will be transported to Nicholasvsk, on the Sea of Ochotsk, Siberia, by a steamship in waiting for it. This lot of machinery is for eight steamboats that are being built in Nicholasvsk by a Russian gentleman named P. J. Paholoff, who is engaged in steamboating on the Amoor river. His boats ply between the port at the mouth of the Nertschink, a point opposite the Chinese line, and situated at the head of navigation, or a distance of some 2,000 miles from the mouth of the river. These boats are used almost exclusively in the tea trade, and will carry cargoes of tea up to Nicholasvsk, on the Ochotsk sea, for shipment to San Francisco. The enterprise is a grand one, and the contrast of Mr. Allen is one which speaks well for the enterprise of the city. Much credit is also due Mr. A. C. Bird of the North Missouri; Geo. Olds, of the Kansas City and Council Bluffs, and J. C. Stubbs, of the Central Pacific, for the enterprise manifested in securing this shipment West, instead of by the Eastern route, via New York.

A NEW GUN.—The Indianapolis *Sentinel* says: A stock company is now being organized in this city, to provide for placing upon the markets of the world a military machine that is capable of firing over a thousand shots per minute, and can sweep the field from right to left, or vice versa, without having the position of the carriage shifted. There are six barrels (as with the Gatling gun), but they revolve and are discharged by the turning of a crank which propels the hammer. The cartridges are strung on a strap, 75 on each. When one is exhausted it can be replaced by simply slipping a hook. But one man is needed to operate the murderous weapon, and if perchance the enemy should storm the works, and the operator should see that he could not destroy or delay the advancing columns until reinforced, he could disable the gun by simply taking out the lock and putting it in his pocket as he fled the field. This would prevent his own gun being turned upon him—a decided improvement over the common cannons, which have to be spiked. The inventor is Mr. T. L. Bailey, late of Shelby county. He has letters patent from Washington on the gun, and a special patent on the lock, and has applied to the great powers of Europe for patents.

A NOVEL HOISTING CRANE.—There will be on exhibition in Machinery Hall a hoisting crane that is worthy of mention, which was constructed by Appleby Bros., of London, England. Its general appearance is something like a locomotive engine without the cab for the engineer and the fireman. It is a self-propeller, and used for the purpose of clearing away wrecks and lines of railway in case of collision or other accident. At the end farthest from the engine there is an arm of heavy timber, to which are suspended chains, hooks, blocks and tackle arranged something in the same style as the dredging machines seen upon the Delaware and Schuylkill rivers. The peculiarity of the machine is that it is self-acting; the arm revolves on a pivot near the front, it hoists and lowers about three tons weight, and is driven by a pair of six-horse cylinders, the stroke being about 10 or 12 inches. The wheels are joined by connecting rods and the usual propelling gearing. In order to insure steadiness in the lifting power, in front of the wheels there are patent "clutches," which are under the control of the engineer, intended to take hold of the truck and prevent slipping along the rails. This machine is worth about \$500.—*Am. Manufacturer.*

FRENCH STEAM WAGON.—The Paris *Figaro* says that a steam wagon was lately tried in hauling a train of artillery on a common road between the fortifications of Montrouge and Chatillon with entire success. Though the locomotive was light, with an engine of only 8-horse power, yet it drew a train weighing 20 tons up hill, down hill, turned round, and was entirely managed by one man, who fed the fire, started and stopped, and governed all the movements.

AN OLD ENGINEER.—There is an engineer running now daily, except Sunday, from Chambersburg to Martinsburg and return, on the Cumberland Valley railroad. He commenced in Moroh, 1839, as a fireman, and after the expiration of two years was appointed an engineer, which latter position he has occupied ever since, a period of 35 years, altogether fireman and engineer 37 years, giving entire satisfaction to the company. He is in the 66th year of his age, and his name is James Adams.

WEAKENING RAILS BY DRILLING AND PUNCHING.—The following experiment is mentioned by Hookney, in his "Manufacture of Steel." 1. A piece of rail with no holes in it stood a blow of one ton falling 20 feet. 2. A piece of the same rail with a punched hole through the web broke under the first blow at a three foot fall. 3. A piece with a drilled hole the same size, while it stood the first blow at a two foot fall, broke with the second blow at a four foot fall.

SCIENTIFIC PROGRESS.

A New Test Proposed for Arsenic.

Dr. Edmund W. Duvy has communicated to the *Chemical News* a new test for arsenic, or rather a modification of the application of the principle of Marsh's test. He writes: The metal aluminium, and more recently magnesium, have been proposed as substitutes for zinc in Marsh's process, or in Fleitmann's modification of it, as being less likely to be contaminated with arsenic than that metal. The modification which I would now suggest, and which, as far as I can ascertain, has not hitherto been proposed, is the employment of an amalgam of sodium and mercury as a means of generating the hydrogen required for the test; and by the use of this substance I do away with, altogether, the necessity of any acid, and I employ two metals which are not liable to arsenical contamination. As to sodium I am not aware that arsenic has ever been pointed out as one of its impurities, and as to its presence in mercury, that is, I believe, a circumstance of very rare occurrence; but, should it exist in that metal as an impurity, it can be readily removed from it by digesting the mercury in dilute nitric acid and afterwards well washing it with water. The amalgam which I have found to answer very well for the detection of arsenic consists of one part by weight of sodium to eight or ten parts of mercury, and is easily made by heating moderately in a test tube over a lamp the mercury, and then adding gradually in small pieces the sodium, taking care to keep away the face, if unprotected, from the mouth of the tube, lest some of that metal in an ignited state might be spirited out during the addition of the first portions. Those metals readily combine under these circumstances, forming an alloy that is liquid whilst hot but becomes hard and brittle when cold. The contents of the tube, while still hot and liquid, are quickly poured out on a clean plate, and, when cool, broken up in small lumps, which are then immediately placed in a well corked or stoppered bottle.

The way I employ this amalgam is simply to place the suspected solution or solid matter, along with a little water, in the bottom of a test glass; then add a small bit of the amalgam about the size of a grain of wheat, and lastly, place without delay, on the top of the glass, a piece of white filtering paper or the cover of a white porcelain crucible, moistened with a drop of a dilute solution of nitrate of silver, slightly acidulated with nitric acid, when, if arsenic is present, a dull black or deep brown stain on the paper, or a dark silvery one on the porcelain, will be quickly developed in the part moistened, owing to the silver of the salt being reduced to a metallic condition by the agency of the arseniureted hydrogen thus evolved.

Artificial Eyes Made Sensitive to Light.

Among the curious developments of science is the recent production, by Dr. C. W. Siemens, of an artificial eye that is sensitive to light. We wish we could add that it gives vision to the blind; but we cannot, though perhaps it contains a germ of promise in that direction. The new eye is composed of an ordinary glass lens, backed by an artificial retina of selenium. This mineral resembles and is allied to sulphur; it is distilled from bodies that contain sulphur in conjunction with metals, such as iron pyrites, a compound of sulphur and iron.

Mr. May, a telegraph clerk employed at the Valencia station of the Atlantic cable line, first observed, in 1873, that the electrical resistance of selenium was instantly altered by light, the resistance being diminished by increase of light.

Dr. Siemens makes use of this peculiarity of selenium in the construction of his novel eye. An electrical circuit is arranged, of which a bit of selenium forms a part, and constitutes the retina. When a strong light is admitted into the lens and falls upon the selenium retina, the current of electricity flows, and by acting upon small magnets may be made to work the artificial lids of the eye, opening or closing them according to the intensity of the light.

It is well known that the vibrations of musical sounds may, by an ordinary conducting wire, be electrically transmitted and successfully delivered to the ear. It remains to be determined whether light vibrations can, by means of selenium and electricity, be transmitted to the brain in the absence of the natural eye.—*Scientific American.*

NEW SUBSTITUTE FOR GOLD.—The following is a new metallic alloy which is now very extensively used in France as a substitute for gold: Pure copper, 100 parts; zinc, or preferably tin, 17 parts; magnesia, six parts; sal ammoniac, 3.6 parts; quicklime, 1.8 parts; tartar of commerce, nine parts and mixed as follows: The copper is first melted, then magnesia, sal ammoniac, lime, and tartar are added separately and by degrees, in form of powder. The whole is next stirred briskly for about half an hour so as to mix thoroughly, after which the zinc is added in small grains by throwing it on the surface and stirring it until it is entirely fused. On this being done the crucible is then covered and the fusion maintained for about 35 minutes, after which the surface is skimmed and the alloy is ready for casting. This alloy has a fine grain, is malleable, and takes a splendid polish. It does not corrode readily, and for many purposes is an excellent substitute for gold.

New Method for the Quantitative Analysis of Silver.

The method recently proposed by M. J. Volhard is based upon the circumstance that soluble sulphocyanide combinations with acid silver solutions form a white curd-like precipitate of sulphocyanide of silver. The same precipitate of sulphocyanide of silver is also obtained when silver solution is in the presence of the red solution of sulphocyanide of iron, the color of the latter disappearing instantaneously under the change. If, therefore, a solution of sulphocyanide of potassium or sulphocyanide of ammonium is added, drop by drop, to an acid silver solution, to which some sulphate of iron has also been added, every drop of the sulphocyanide salt solution creates a blood-red cloud, which, however, disappears upon the solution being shaken, the mixture assuming a pure milk-white color. It is only when all the silver has been precipitated as sulphocyanide of silver that the color of the iron and cyanide remains. If it is known how much sulphocyanide salt is necessary for the precipitation of a certain amount of silver, then it is easy to ascertain the exact quantity of silver contained in a solution.

This method is capable of being very generally employed, for it permits of bodies—such as chlorine, bromine and iodine—being quickly and surely determined by precipitating them with silver solution of known strength, the excess of the added silver being titrated back again by means of a solution of sulphocyanide salts. Especially for the determination of the above elements in organic combination is the new process of Volhard to be recommended. The method has many advantages over Mohr's process, in which bichromate of potash is the indicator.

1. It is carried out with an acid solution, while with Mohr's process a neutral fluid is necessary, thus curtailing at once its utility.

2. The combination—the color of which serves as an indicator—is soluble, so that the retroaction is more easily known.

3. The salt serving as indicator (the sulphate of iron solution) is itself uncolored, and can therefore be added in larger quantities.

To make his titrating fluid, Volhard employs sulphocyanide of ammonium. As this salt is too hygroscopic, in order to weigh it in particular quantities the solution is put into a silver solution, obtained by dissolving 10 grammes of pure silver in nitric acid, and diluting to 1,000 cubic centimeters. In another vessel a quantity of sulphocyanide of ammonium is dissolved in water, so that eight grammes are contained in every liter of water. Ten cubic centimeters of the silver solution are put into a beaker, and to it are added five cub. cent. of a pure solution of sulphate of iron (a liter containing 50 grammes) together with 150 to 200 cub. cent. of water. From a burette the sulphocyanide solution is gradually added, agitating the while, until the fluid has attained a feeble red tone. Assuming that for 10 cub. cent. of silver solution 9.6 cub. cent. of sulphocyanide solution have been used, 960 cub. cent. of the latter is diluted to 1,000 cub. cent. One cub. cent. then shows 10 or 10.8 milligrammes.

Before use, this solution is again tasted. With this object one gramme of pure silver is weighed, and this is dissolved in eight to 10 cub. cent. of nitric acid; this is heated upon a sand-bath until no further trace of nitrous acid fumes are given off, and to it are then added five cub. cent. of iron solution, the whole being diluted subsequently with 200 cub. cent. of water. On cooling, the sulphocyanide salt solution is added, while the liquid is kept agitated. With the last drop of the hundredth cubic centimeter the red color must have set in visibly and permanently.—*Dingler's Journal.*

ATMOSPHERIC CHANGES AND FIREDAMP.—The decrease of atmospheric pressure which this week has unloosed the spirit of the winds above ground, and probably occasioned a great amount of loss and damage on land and sea, has been no less a source of peril to the miners who work like the moles underground. The damage in coal mines, consequent especially on the sudden fall of the mercury in the barometer tube, is occasioned in this wise. When the glass is high and the pressure of the superincumbent atmosphere correspondingly great, the dangerous carbonated hydrogen is prevented from issuing from the walls and sides of the coal seam; when the pressure is suddenly lessened the gas escapes from numberless cracks and crevices, and accumulating, sometimes very rapidly, until it reaches the proportion sufficient with common air to produce an explosive compound, the naked light that is harmless under more favorable conditions suddenly takes effect and a deadly catastrophe is the result. In this way the barometer and barometrical warnings are almost as useful to the coal miner as they are to the mariner.—*Iron.*

BOUNDS OF MICROSCOPIC INVESTIGATION.—H. E. Sorby, President of the Microscopic society of London, says that with the most highly perfected instrument even the air is too coarse a medium to enable us to see the finest molecules of a substance. Prof. Helmholtz and other physicists claim that they are clearly able to distinguish lines separated from one another only 1-80,000 of an inch, and with the aid of photography and the blue light, can depict lines removed 1-112,000 inch, but we are able to see how far short even such an instrument comes, when we consider the millions upon millions of molecules that exist in ulmen and other substances, which only occupy a space of a thousandth of a cubic inch.

50	Leviathan	.....	80c	300	Jefferson	.....	90c
100	.....	b 5	80c	300	Jenny Glyn	.....	90c
100	Miner	.....	10c	50	.....	b 10	10c
30	Mexican	.....	340c	50	.....	h 30	120c
55	Martha Beesse	.....	330c	10	Julia	.....	70c
50	McKee	.....	10c	15	Manfield	.....	70c
120	N Con Virginia	.....	10c	225	K K Con	.....	20c
200	North Carson	.....	15c	100	Kohler	.....	20c
20	.....	b 5	50c	15	Lebanon	.....	20c
20	Ophir	.....	50c	15	Mexican	.....	20c
20	.....	b 5	50c	20	Monumental	.....	25c
10	.....	.....	50c	30	N Con Virginia	.....	10c
10	.....	.....	50c	15	Naselle	.....	50c
100	Red Cross	.....	20c	5	Prospect	.....	50c
45	Sierra Nevada	160	160c	10	Rock Island	.....	50c
200	.....	.....	50c	100	Succor	.....	50c
60	South Justice	.....	20c	400	Shasta	.....	40c
60	South Carol	.....	30c	50	Senator	.....	50c
400	South Ophir	.....	10c	300	South Carolina	.....	50c
100	.....	.....	10c	300	South Carolina	.....	50c
800	Trojan	.....	600c	50	Trojan	.....	50c
20	Union Con	.....	b 5	400	.....	h 30	50c
400	Wells Fargo	.....	370c	300	Wells Fargo	.....	300c

CHOICE VOLUMES.—We have a full new set of Scribner's Monthly—ten volumes—well bound, for sale at this office. Price, \$2 per volume.

29th, consider a proposition to increase its capital stock from \$5,400,000 in 54,000 shares, to \$10,800,000, in 108,000 shares.

It would appear from the above that the epidemic of increasing capital stocks of mining companies has come upon us again.

Senator Sharou's arrival from Washington seems to have had some effect on the stock market, or what was the same thing, people supposed it did, and Thursday was a livelier day in stocks on California street than has occurred for some time.

No Boiler Inspector.

The Judiciary Committee of the Board of Supervisors have reported that the appointment of a Boiler Inspector as provided for in the bill which passed the Legislature and was signed by the Governor, is not mandatory, but is left to the discretion of the Board. Boiler makers and engineers have all along been opposed to the new inspectorship as being useless and expensive, and there has been a very general and strong opposition to the new office. The report of the Judiciary Committee of the Board—Messrs. F. F. Strother, F. A. Gibbs and D. A. MacDonald—gives sufficient reasons why no appointment should have been made. It was as follows:

In the matter of the bill for the creation of the office of Boiler Inspector and the appointment of such officer, they report that after careful consideration and investigation they have come to the conclusion that the appointment of said Boiler Inspector as provided in said bill is not mandatory, but left discretionary with the board. They believe that the bill in itself, so far from proving a benefit to this community should its provisions be carried out, would prove an injury by offering opportunity for a system of blackmail and corruption. Within the past quarter of a century, during which time the community has had no such officer, there has been but one boiler explosion of note. Other cities where a similar law to the one under consideration is in force have frequent recurrence of these accidents. Boiler makers and engineers who have come before this Committee are unanimous in the opinion that the oftener boilers are tested the more liable they become to explode. They argue, and with good reason, that the oftener the plates are strained by the hydrostatic test the weaker they become. They show that the test proposed in the bill will exclude from the manufacture of stationary boilers certain kinds of iron which are now used, compelling makers to adopt iron of a much more expensive quality, though not superior for the purpose; that the Inspector cannot prove a boiler new in use made of English iron, and that a large stock of iron now in the hands of dealers cannot find any sale whatever, thereby working great hardship to a large class of our merchants. They conclude that as engineers, mechanics and iron men are more interested than any others in preventing boiler explosions, loss of life and damage to property, there can be no necessity for the appointment of a Boiler Inspector, who is only interested in his examination fee of \$3. Supervisor Gibbs, who has been assiduous in procuring evidence in this matter, brought before the Committee the heads of all the most prominent foundries, iron houses and boiler making establishments in the city, men who had been in the business from 15 to 25 years, all of whom were unanimous in the opinion that the law creating a Boiler Inspector is an absurdity, if nothing worse, and the office itself unnecessary and uncalled for. Wherefore your Committee have come to the conclusion that it is neither just nor expedient to proceed to an election for a Boiler Inspector of this city and county.

The report was adopted by the Board without a dissenting voice.

New Incorporations.

The following companies have filed certificates of incorporation in the County Clerk's office at San Francisco:

MOLLIE STARK M. Co.—May 4th. Object: A general mining business. Capital stock, \$10,000.00. Directors—M. Higby, L. H. Van Schalk, A. Provo Kluit, A. T. Sweet and S. N. Putnam.

LAURENCE BURNETT M. Co.—May 4th. Location: El Dorado county. Capital stock, \$5,000.00. Directors—J. J. Laderich, J. E. Laderich, W. Kullberg, J. B. Crocker and N. Hueter.

NEW ERA G. & S. M. Co.—May 4th. Location: Alpine county, Cal. Capital stock, \$1,000.00. Directors—E. A. Hatherton, P. Ameraux, C. Wittram, W. A. Beal, E. F. Russell, G. W. Boyle and O. M. Grant.

SAN FRANCISCO AND CALIFORNIA G. M. Co.—May 4th. Location: Province of Ligua, Chile. Capital stock, \$1,000.00. Directors—W. B. Ewer, W. C. Quinby, W. H. Murray, A. H. Evans and A. B. Burns.

SOUTH PAXMASTER M. Co.—May 8th. Location: Nevada. Capital stock, \$10,000.00. Directors—M. A. Shepard, C. H. Stanyan, R. L. Taylor, L. Rice and Martin White.

JERRY LEROY DRICH & M. Co.—May 8th. Object: General mining business. Capital stock, \$300.00. Directors—J. B. Reynolds, A. J. Beverance, W. H. Reynolds, C. E. Buckingham and H. S. Smith.

CON. WYOMING M. Co.—May 8th. Location: Nevada. Capital stock, \$10,000.00. Directors—A. G. Burnett, V. J. Burnett, Charles Pace, J. J. Hicks and Charles E. Elliott.

SAN FRANCISCO AND NORTH PACIFIC R. R. Co.—May 10th. Capital stock, \$12,000.00. Directors—Leland Stanford, Mark Hopkins, C. P. Huntington, E. H. Miller, Jr. and C. H. Cummings.

ROASTING OF GOLD AND SILVER ORES, and the Extraction of their Respective Metals without Quicksilver. 1870. It contains 142 pages, embracing illustrations of furnaces, implements and working apparatus. Price \$2.50 coin, or \$3 currency, postage free. Published and sold at this office.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

California.

ALPINE.—**CLOREN DOWN.**—*Alpine Chronicle*, April 24: Manager Chalmers, having given the different grades of each checker ore a fair working at the mill, all to his satisfaction, will close down on the mill to-night, for the purpose of adding a 10 stamp battery and a furnace of 30 tons capacity. In the meantime ore will be raised from the mine, so there will be hundreds of tons ready for reduction when the mill and furnace are ready to run. When these improvements are completed our Loudon comb will not have to face so many Irish dividends.

ANOTHER MINE SOLD.—The Marion mine, at Monitor, has been sold to San Francisco parties, and a first-class company is being organized to push it to a development.

AMADOR.

MINING AT HUMBOLDT HILL.—*Amador Ledger*, May 6: The Italian company, who own a gravel claim on the other side of Humboldt hill, adjoining Truett & Bellard's mine, have constructed a bedrock flume and built a reservoir, and commenced mining operations on Tuesday. The claim prospects well, and is thought to be as good a gravel mine as there is in the county.

STUCK PAY DIRT.—The Austrian company, who have been engaged in running a tunnel into the hill near Jackson Gate, struck what is considered the main channel of pay dirt early in the week. The claim was bonded a short time ago, and will no doubt prove a paying property.

CLEAN UP.—*Stockton*, or "Lucky Dick" as he has been christened, has made another clean-up on his placer claim beyond Volcano. The amount realized is not definitely known, but from the fact that he is in the best of spirits and appears to be well supplied with coin, it is thought that he has gathered in another little pile.

GRAVEL CLAIM.—We learn that work upon this claim, located upon Sutter creek, is still being pushed with energy. No clean-up has been made, but the prospects which have been obtained show that the claim is destined to figure well in the placer mining in this county. The owners have already put themselves to much expense in getting the mine in working condition.

BUTTE.

HALF A MILLION.—*Groville Mercury*, May 6: The claim of O. P. Powers & Co. could not be bought for less than half a million dollars. In fact, it is doubtful whether the company would sell it at any price. Good judges declare it to be the best gravel mine on the coast, and as soon as the new ditch is brought in the work of mining will begin in earnest. With only 500 inches of water it pays anywhere along the river bluff at the rate of \$100 per day, and it takes only three men to do their work. It extends along the river bank for more than half a mile, and every inch of it will pay as much as that cleaned up last week. Strange that such a fortune should have lain so long upon the ground, and that the present owners should get it for the small sum of \$45,000. The claim was almost given away.

CALAVERAS.

MINES SOLD.—*Calaveras Chronicle*, May 6: The Mount Tmolus quartz mine, located in the Julius Maria district, formerly owned by Messrs. E. and M. Bigney, J. E. Tynan and J. A. Lefoy, has been sold to Messrs. Legare, of Chicago. The mine is one of the most promising in the county. We understand it to be the intention of the new proprietors to put effective machinery upon the mine immediately. We are not at liberty to state the sum for which the mine was sold.

WORKING COMMENCED.—The work of sinking the shaft in the Gwin mine has been commenced. Another 100 feet will make the shaft 1,200 feet in depth, at which point a level will be run. The batteries are now being supplied with ore from the slopes of the 1100-ft level, and sinking the shaft will not interfere with the mining and milling operations at all. The object is to keep a "gusher" going.

NEARLY COMPLETED.—The work of erecting one of Cooper & Cowles' giant mills on the Brady quartz mine, near Buckeye, is going rapidly forward and approaching completion. The hurdy-gurdy wheel that is to furnish the motive power is also being placed in position, and the 11-inch iron pipe necessary for conducting water to it is already on the ground. It is expected that the mill will be in readiness to commence crushing some time next week.

BRIEF MINING NOTES.—A contract has been let for sinking the shaft in the Grassehorn mine, at Mosquito, 50 feet deeper. Immensely rich rock is being extracted. Ore is now being hauled from the mine to Harris' mill. San Bruno, sinking. Good rock is being taken from the San Joaquin company's mine. A hundred tons of ore in the dumps.

COLUSA.

OUR COPPER MINES.—*Colusa Sun*, May 6: It is not generally known that Colusa county contains some of the very best copper mines in the State, and that work has been progressing on them very satisfactorily for some time. There is plenty of the very richest ore to be found, and the only drawback has been the cost of production. We now see that a new process has been put in operation at San Francisco, which reduces the most rebellious ore very cheaply. If this is so, the men who have held on to their claims will be glad to see good work done. The best of these are Julius Weyand, of Stony creek, and J. H. Lening, Jacob Williams and C. Kopf, of Colusa.

EL DORADO.

STUCK IT RICH.—*Mountain Democrat*, May 6: We caught a glimpse the other day of a few samples of the ore which J. H. Naper is taking out of his claim at Poverty point. It was chock full of threads and plates of gold, which would yield by hand-mortar process hundreds—perhaps thousands of dollars per ton. The ledge, where these specimens were taken out, is about three and a half feet thick, but of course is not all like these specimens have described. If it were, Oahu would pay off the national debt in six months.

NORTH SIDE MINING ITEMS.—"Toney" writes us from Greenwood, under date of April 29th, as follows: The Sliger mine is still being worked by a full complement of hands, and is, as usual, producing well. The first southern extension of the Cedarberg is about to be opened. The original Cedarberg is lying with interest, for some reason known only to the owners. I suspect a game of "freezing out." Mr. Deamarchie, an experienced miner, is successfully operating the French claim. At the St. Lawrence gravel mine a large amount of gold is being extracted, and report says that the mine is paying nicely. The Ausador mining company have commenced work on their location, with flattering prospects for a good mine. The Rozekrane mine is again free from water. I think that Superintendent Burroughs make a mistake in trying to work the mine with the machinery on the ground, the mine having been full of water most of the time this winter. But the mill is at present running every day and crushing very good ore. The rock is the richest ever seen in the mine, and it is rich in sulphur, which assay "pays up." The Mansfield mine, J. L. Smith, superintendent, is looking well. Mr. Smith informs me that the machinery is on the way for working the mine properly, including a Burleigh drill and engine complete. I was surprised to find this mine looking so well, as

common report was rather against it, but a large amount of labor has been done, and there is a fine lot of ore on the dump which looks well, showing gold in paying quantity. The superintendent informed me that the ledge is seven feet wide at the bottom of the shaft, the ore averaging same grade as that on the dump.

FRESNO.

FINE QUARTZ.—*Fresno Expositor*, May 3: Yesterday T. T. Strombeck left at this office a number of specimens of gold-bearing quartz taken from a vein lately discovered on Sprague gulch. The rock shows a large amount of free gold and is exceedingly rich. The ledge is about 30 inches wide and is well defined. It has been prospected to the depth of eight feet with encouraging results. Mr. Strombeck owns a liberal interest in the find, and he says he thinks it will beat Ten Jones' mine all to pieces.

INYO.

LOCAL NOTES.—*Conso Mining News*, May 6: In the De-fiance mine in the wide, north upper workings, at a depth of 40 feet, a drift has been started and run north a distance of 100 feet, developing a splendid body of ore for the entire distance, with plenty of it still in face of the drift. This drift will be continued so long as ore is found. Since last report a splendid body of solid galena ore has been struck in the drift running north from the south winze, at a depth of 125 feet. The new, or bolting shaft, has been sunk and timbered to a depth of 75 feet, the work being done in a splendid manner. When this shaft has attained a depth of 100 feet, drifting to connect with the south winze will be commenced.

INYO CONSOLIDATED MINING COMPANY.—Several weeks ago we mentioned the departure of Mr. Chas. Dale, who was formerly foreman for the New Consol mining company, on business in San Francisco, in connection with the formation of a company to operate in the development of some excellent mining property here. Mr. Dale made two trips to San Francisco in order to perfect arrangements. Last Sunday he returned and informs that his company, incorporated under the name of the Inyo Consolidated mining company, and owning the southern extension of the Lucky Jim, (one of the New Consol company's mines), have commenced active operations by the erection of blacksmith forges and grading for the new Inyo shaft. A contract is to be let immediately to sink 100 feet on the ledge.

ROSE SPRINGS.—L. Rodaspoitch came in from Rose Springs last Thursday evening, and reports everything there progressing very favorably, the mines looking well. Mr. Irwin, Superintendent of the Inyo mining company, is looking around for a better and larger supply of water for their mill, which they intend to build soon. He is now absent over to the Furnace creek country, some 15 or 20 miles from Rose Springs, to see if the fountain head is high enough to produce a sufficient pressure to send it across Death valley in pipes to Garabaldi mine.

A NEW DISTRICT.—A district called New Amargosa was organized about six weeks ago by Chas. Anthony, John Battle and Jas. Parker. It is situated southeast from Rose Springs 60 miles. Mr. Irwin says the gentlemen mentioned have located a number of mines which on top look very well. The veins are gold and silver bearing, the ore assaying very high.

CONSO CONSOLIDATED.—Work on the Bella Union has been prosecuted for a number of weeks past in explorations and preparing the mine for convenient working. About the middle of June extracting and smelting of ore will be commenced.

DEFIANCE FURNACE.—This furnace started up with its new improved water jacket (Shepard & Rawlings patent), on last Saturday evening at half-past eight o'clock. Our report, therefore, is not for a full week. There have been shipped, since last report, 452 bars of bullion; on hand, 218 bars. The furnace is running well indeed.

LASSEN.

MINING.—*Lassen Farmer*, May 6: A few parties have commenced prospecting and mining along the base of Diamond mountain. From reports we judge there is no trouble to get three dollar diggings along a considerable scope of country, with always the chance of finding something better. There is and will be an abundance of water for some time to come. There are a number of gold-bearing quartz ledges in the vicinity of these places, which, as yet, have never been prospected but little, and not to a depth sufficient to prove them. Work has been commenced upon one ledge recently. From what we can learn we do not believe there is a better section for the industrious prospector to strike valuable mines than that along the side and base of Diamond mountain. We shall endeavor to keep our readers posted on the result of the workings now going on.

LAKE.

LOCAL ITEMS.—*Lake County Bee*, May 4: From Mr. J. M. Davis, of Middletown, we gather the following local mining item: The Wall Street mine has a furnace working, and the mine is looking well. Within the last few days it has made developments of the finest character. The American mine has struck large bodies of high grade ore, and is reducing and shipping mail all the time. The London mining company has recently discovered a fine body of ore, and will probably erect a furnace the coming summer. The Napa Consolidated mine, of the Oak Hill country, has just finished a fine furnace, and have splendid prospects. The Porter and Cooke mine is having a bunch of retorts built. The Great Eastern mine, with Mr. Craven as superintendent, is looking well, and when their furnace is all under way, will be one of the best paying mines of the district. The Great Western mine is too well and favorably known to need any comments from us. Mr. Davis says they are shipping from 400 to 500 flasks of quicksilver per month.

NEVADA.

THE FRYER PROCESS.—*Football Tidings*, May 6: Crowds of people visited the Fryer works on Thursday, which was the grand opening day to the public. As they are now all ready to work ores on an extended scale, having perfected the last of the series of inventions comprising the process, we may expect very soon such a practical demonstration of its capacity to do what is claimed for it as shall completely set aside all doubts in the public mind.

FRANKLIN ALLISON RANCH.—The foundation work at this mine will soon be ready to receive the machinery. The hoisting works will be very complete when finished, the building to be 26 feet wide, 90 long and 22 high.

GOLDEN STAR.—Work on this mine is being pushed along lively. The new shaft has been sunk down to the ledge and the quartz looks fully as well as the last that was taken out.

HOMEWARD BOUND.—The contractors for putting up hoisting works on this mine are fast getting things in shape. They have the foundation timbers nearly all in place, ready to receive the machinery, and the masonry about the boiler is pretty well along.

OSAGE.—A large amount of work is now being done at this mine. They are retimbering and enlarging the shaft, which when completed will have a double track for ore and a pump and ladder way. They are also enlarging the mill, the blocks for two mortars being set and the building nearly completed over the new mill place.

PLACER.

GRATER.—*Placer Herald*, May 6: The main shaft in the Grater mine is now nearly 500 feet deep, and in the very bottom we find the rock is the richest ever seen in the mine. The report comes to be second-hand, though, to use the language of our informant, "the ore in the bottom is fabulously rich."

IOWA HILL.—Mining is now under full headway at Iowa Hill. Water is abundant, and nearly all the claims in the district are in operation. The clean-up

have been encouraging; business, in consequence, is good, and the citizens of that town look forward with reasonable anticipation of soon having one of the live-liest mining camps in the county, if not in the State.

MINING TREASURES.—*Dutch First Forum*, May 4: The break in the ditch of the South Yuba canal company, mentioned in our last issue, was repaired and water turned into it on Wednesday last; it only ran, however, a short time, when it broke again, and has been repaired and broken several times since. On Friday morning it broke in such a manner as to carry away the ditch of the Miners' ditch company. The South Yuba canal company has been exceedingly unfortunate lately, it appearing as though one break was hardly repaired before another occurred. We are informed that the Polar Star claim for the 17 days prior to Monday night were only enabled to wash 28 hours, which was done at odd spells. The last break was repaired and water was passing here on Tuesday. It is to be hoped that this time it will stay "put," as our miners having had such an unfavorable winter are now anxious to improve every hour. The break in the Miners' ditch mentioned above was repaired in 24 hours and water is passing through. The ditch of the Cedar creek company continues carrying its full capacity of water. The Yankee tunnel has been started up again; tunneling was resumed on Monday morning. It is the intention to drive it with all possible speed till the next shaft is reached. The Elmore Hill cleaned up on Tuesday. The claim is cleaning up. The Yankee, Hadger, Boston, Joho-haphat, Cental and the new claim are all washing to good advantage. The Polar Star claim started on Tuesday morning. At Gold run the Indian Hill and Cedar claims continue washing. The Gold run claim is washing at odd spells, much time being required to break boulders and blast up bedrock cuts. The Jackson or Miami claim resumed washing on Tuesday morning. This claim recently cleaned up with very satisfactory results; this, however, was the only clean-up this year, owing to the numerous breaks in the ditch of the S. Y. C. Co.; the owners were unable to obtain water. A blast of 60 kegs of powder was exploded in the Badger claim on Monday, doing splendid execution. A much larger blast, consisting of 300 kegs of powder, was exploded in the Elmore Hill claim on Tuesday, loosening an immense quantity of rock. Superintendent of the Cedar Creek company has introduced into the Yankee claim one of Hoskins' new mining lamps. The night foreman and all the men working nights in that claim assert that they do not want any more pitch wood, that the lamp gives a much better light than any fire jack they ever worked with.

PLUMAS.

PLUMAS.—*Plumas National*, April 29: The big mine is running very light at present, only about 50 men being employed. The water mill will be started just as soon as there is sufficient water from the ledge to run it. The Superintendent, Mr. Moore, is at present here. This company will be likely to lay in a much larger supply of wood hereafter, and not take chances of being out in consequence of a heavy winter. By the way, their beef contract will be let on the 1st of May, and those who propose to bid will have to be on hand. **HEAVY WORK.**—On Friday of last week the Maxwell company raised a railroad trestle 54 feet high, with braces, girds and all complete. From the time it left the ground till it was erected in its proper place was just 32 minutes. This is one of the 16 trestles for their high flume crossing Butterly creek. In the seven miles of ditch they are now building, the engineer reports about one and one-half miles of flume. Our old pioneer friend Maxwell is the Superintendent.

SANTA BARBARA.

THE QUICKSILVER MINES.—*Santa Barbara Press*, May 6: The Los Prietos and Santa Ynez mines are commencing work again, although on a small scale in comparison with last year. Every day miners are going out, and occasionally one or two come in and report things as getting lively. The prospect at present points to a successful year. Mr. F. Mahon, the superintendent, is thoroughly acquainted with quicksilver mining and will no doubt manage matters satisfactorily, but he will do well if he improve on the management of his predecessor, the late superintendent, Mr. Fred Homer, who is also an expert in mines, quicksilver in particular. Many a company lost a good mine when they got him gone. We were informed the other day that a miner who has arrived in town from that locality, that one or two important leads had been struck, and that work would proceed immediately.

Nevada.

WASHOE DISTRICT.

MEXICAN.—*Gold Hill News*, May 4: On the 1465-ft level, north drift is steadily advancing, and is following the east wall of the ore vein, the face showing some fine streaks of quartz. Further back, north of the Ophir line, a west cross-cut has been started to determine the character of the vein. The face of this drift is now in a very favorable formation. On the 1600-ft level of the Ophir, a drift has also been started north to penetrate the ledge immediately under the ore body resting on the 1465-ft level.

EAST OVERMAN.—This is a most excellent location, east of the old Overman claim, and in the main east range of the Comstock, and directly in the heart of the great ore belt. A splendid ledge of good lively quartz crops out at the surface, and under the present very able and efficient management a good and practical shaft of three compartments has been commenced, which is to-day down to a depth of 26 feet. It is all the way in quartz and the most promising ledge matter, and bids fair to develop good pay ore before many weeks. The company was recently incorporated.

CHOLLAR-FOTOSI.—Daily yield, 80 to 100 tons. Assay value, \$34 per ton. Sinking the main incline below the level the face still in quartz. Sinking the new combination shaft is making splendid progress. The erection of the powerful hoisting and pumping machinery at the new shaft is going steadily forward.

YELLOW JACKET.—On the 1940-ft level cross-cut Nos. 1 and 2 are being pushed steadily ahead. Cross-cut No. 3 has also been advanced eastward 20 feet, at which point a station is being cut out to sink a winze on the level below the 1940-ft level. The north and south drifts from cross-cut No. 3 are also being gradually extended north and south on the ore vein.

COSMOPOLITAN.—The apraise above the main tunnel level was up 124 feet this morning, and in very good average ore, some streaks of which show richly in free gold and assay very high. The main incline is steadily being driven ahead to the northward, following the vein, with the face in fair milling ore.

OPHIR.—Daily yield, 150 tons of ore. The new compartment of the shaft has been finished down to the head of the incline at the 1600-ft level. The entire works are now in the finest possible working condition. The south drift on the 1100-ft level is steadily advancing, the face still in quartz of a highly payable nature for the development of an ore body. The uprise from the 1300-ft level is now up nearly 100 feet, the face still in ore. On the 1600-ft level the south ore etope, which are now within about 150 feet of the California line, are yielding rich ore, the quality of which appears to be growing better as the slopes of the etope grow downward. The north drift on the 1600-ft level is also being advanced with Burleigh drills worked by compressed air, to reach and prospect the ore vein under where the ore was found a short time since in the Mexican mine. A west drift has been started on the 1600-ft level, 120 feet south of the Mexican, which is showing some very favorable prospects. On the 1700-ft level the damage done by the water is much less than was expected, and the north drift is now being cleaned out and repaired, preparatory to pushing it ahead into Mexican ground. The mill is kept steadily running on ore from the mine.

CALIFORNIA.—Daily yield, 350 tons of ore. The ore breasts continue to open up rich and handsomely as

the work of development progresses. The California mill has been kept steadily running on ore from the mine, and on the first of May the Sacramento mill was added to the crushing capacity. The yield of the California mill alone for the month of April will not fall short of \$1,500,000. The north drift, on the 1400-ft level, is steadily advancing toward the Ophir line, the face in a mixture of clay, quartz and porphyry. Sinking the winze below ground No. 3, on the 1500-ft level, is making the usual excellent progress.

CON. VIRGINIA.—Daily yield, 500 tons of ore. Everything has been running perfectly smooth with this mine until a day or two ago, when, by accident, the cylinder heads of the driving engines of the Brunswick mill were burst, so as to stop the entire mill. This is a serious drawback, as the cylinders cannot be replaced under 30 days, and the loss of the mill must considerably reduce the production of hullion for the month of May. It also cuts short that of April nearly \$200,000. The return of hullion from the mills for April will not now reach over \$2,250,000. The ore slopes are looking splendidly, and there are no changes of interest to report of any portion of the mine. The grading for the great ore of new deep battery mill below the C. & O. shaft has been commenced. The machinery for both the battery and amalgamating mill is now being forwarded and will soon all be on the ground ready for erection.

LADY WASHINGTON.—The pump-ho arrangements at the 600-ft station are about completed. The shaft has penetrated over 40 feet into the most promising ledge matter, with strata of quartz and low grade ore, but lately exposure to the air has shown it to be of that peculiar swelling nature so frequently encountered along the Comstock range, crushing in the heaviest timbers with a gradual but irresistible force. This has necessitated a suspension of sinking the last two or three days in order to ease up and secure the timbering. There is no increase of water, the pumping and other machinery works splendidly, and sinking will be proceeded with at once under the most favorable auspices.

COLUMBIA.—The mine has a very favorable location, adjoining the Senator on the north and lying just east of the Gould & Curry. A fine shaft, with two compartments, has been sunk to a depth of 365 feet. Recently Mr. J. C. Lennon received the appointment of superintendent, and seeing the immediate necessity of having another compartment commenced at once to enlarge the shaft by raising up a third compartment from the bottom. This work is now well under way.

JUSTICE.—The ore in the slopes on the 600-ft level is showing better as the slopes are more developed. The upraise from that level to connect with the 400-ft level is also in good ore. The winze below the 800 has reached the 1000-ft level, and a cross drift has been started to connect with another cross drift now being run from the main shaft drift on the 1000-ft level for that purpose.

BULLION.—The northeast drift on the 2000-ft level is steadily advancing toward the ledge, the face still in the hard black dikes heretofore spoken of. The face seems to be softening somewhat and the seepage of water steadily on the increase.

KOSCIUSKO.—During the last part of the week a heavy flow of water burst into the south drift on the 500-ft level, driving the men out and flooding that portion of the mine. The pumps not only held their own, but at the end of three days began to gain on the flow, when by an accident the pumps were disabled and the water rose rapidly in the shaft. By yesterday noon, however, another pump had been set to work and the water is now being rapidly lowered, and will probably all be out in a very short time. This water comes from the ledge, and when taken out will drain the mine down to the 500-ft level.

DAYTON.—The water has been drained from the shaft and the sinking below the 700-ft level was resumed this morning. The 700-ft station has been completed and the drift running to cut the ledge at that point is advancing rapidly. The north and south drifts on the 500-ft level are each pushed steadily forward, still following the east wall of the ledge, with many indications of soon opening a fine mineral vein. Nearly 900 feet of the ledge on this level has now been laid bare, ready for cross-cutting.

SIERRA NEVADA.—Sinking the main shaft is going steadily ahead, the bottom in good working ground. The north drift on the 1500-ft level is steadily advancing, the face still in quartz and ledge matter.

JULIA.—Sinking the shaft is making the usual good rate of progress. The station at the 1300-ft level has been opened and a drift started to prospect the ore vein at that point. Should the concentration of the quartz and ore continue to improve in the same proportion as on the level above, there is hardly a doubt but a paying vein will be opened.

PROSPECT.—Shaft 218 feet deep to-day. It was turned over into the hands of the present contractor on the first of the present month and is sinking deeper goes forward very energetically. The Ingersoll rock drill is employed to very good advantage in doing this, making with their assistance about four feet per day.

KNOWSRECKONER.—The work of sinking the main shaft is progressing well, about two feet per day. The rock in the bottom of the shaft is quite hard but works well. The water in the mine has decreased a little.

WARD.—The shaft is down 65 feet. The south drift on the 1000-ft level of the Julia shaft is steadily advancing toward the Ward line, the face in a very favorable description of ground.

BRUCE.—The shaft is down 400 or 400 to 10. There are no material changes in the mine at any point. Sinking the air shaft for the reception of the pumps is making the usual good progress. The erection of the new pumping machinery is going forward at a very rapid rate.

MINT.—The shaft is now down 70 feet below the 1000-ft level, the bottom being in soft ledge material. The flow of water remains unchanged.

SILVER HILL.—Sinking the main ledge is again progressing at a fair rate of speed, the bottom in hard blasting ground. It is now down 169 feet below the 440-ft level.

AMAZON CONSOLIDATED.—Sinking the main shaft is making good progress. The north drift, which has penetrated into the Glasgow ground, is showing some fine sulphuret ore in streaks.

SUCCON.—Sinking the main shaft is still going ahead at a very lively rate. The flow of water is still strong at the bottom, but is easily handled by the pump.

TROJAN.—The new hoisting works and machinery are rapidly approaching completion.

OVERMAN.—Sinking the shaft has made the usual progress during the week. The rock is still very hard and the flow of water strong.

IMPERIAL.—The north drift on the 2000-ft level is still in ore of a good character.

GOULD & CURRY.—Everything is being done that is possible to forward the completion of the foundations for the new pumping machinery. The repairs to the shaft are making favorable progress.

SLABBER.—The new machinery for the pumping shaft is being placed in position as rapidly as the workmen can perform the necessary work.

LADY BYRON.—All possible energy is being used in making the excavations and putting in the foundations for the reception of the new hoisting and pumping machinery.

GROSE CONSOLIDATED.—Everything in and about the mine is again in fine running order, and the north and south prospecting drifts on the 300-ft level are being steadily advanced.

NORTH CARBON.—The erection of the new hoisting works goes ahead energetically. The hoiler is in place and the other machinery will soon be. The main building is 75 feet long by 30 feet wide, the boarding, house and other requisite buildings are in good shape, and the new works will be steamed up in a very short time, when active mining operations will be inaugurated.

NORTH CONSOLIDATED VIRGINIA.—The shaft is down

275 feet. It is the intention to open a station and put in water tanks for catching up the flow at the 900-ft level whenever that point is reached. The appearances are that the ledge is not far away.

CROWN POINT.—The south prospecting drift on the 1700-ft level is steadily advancing to connect with a winze being sunk from the level above for air purposes.

NEW YORK CONSOLIDATED.—Preparations are now being rapidly completed for driving the prospecting work of this mine in a more vigorous manner than it has ever been done heretofore.

BALTIMORE AND AMERICAN FLAT.—The 1250 ft station is opened and a water tank is being put in and the pumps lowered to that point. A drift will now be started to cut and prospect the ore vein at that point.

UTAH.—Sinking the main shaft proceeds steadily, the bottom still in hard porphyry. The rock blasts well, but admits of only a slow rate of speed in sinking.

UNION CONSOLIDATED.—The north drift on the 1300-ft level is steadily advancing, the face in quartz and soft ledge material. The drift from the bottom of the winze on the 1465-ft level is entering a very favorable ledge formation.

REX AND WARD CROSS.—The shaft is well and thoroughly timbered from top to bottom, but its depth now necessitates the erection of hoisting machinery.

FLORIDA.—The shaft is in good repair and the water reduced to below the 400-ft station. The drift to the ledge at that point is now being cleaned out.

DANEY.—The water has been extracted to below the 400 ft station, and a new water tank is being put in at that point.

NEVADA.—The main drift north is still pushing ahead, and since last report has run into porphyry and clay. The superintendent thinks this is the outer wall of the main ore chimney found in the level above.

WOODVILLE.—Nothing is yet being done in the mine, owing to the unsettled state of some of the old accounts. It is expected that everything will now soon be settled up ready to resume sinking.

BROOKS.—Sinking the shaft going steadily ahead in the most energetic manner. The prospect of the mine are of the most favorable character.

NIAGARA.—Sinking the incline shaft is pressed ahead with all possible energy. As soon as a sufficient depth is attained a station will be opened and drifts started to prospect the ore vein.

LAROE.—Preparations are being made to erect good substantial hoisting works.

HALE & NORCROSS.—The shaft is again in splendid condition for good work. The erection of the new pumping machinery is progressing at a rapid rate.

CALEDONIA.—The rock still continues hard at the bottom of the shaft. The flow of water is still strong.

LEVATHAN.—The station at the 600-ft level is opened, well timbered, and the main drift for the new tunnel well under way.

SENIOR.—Are yet at work hoisting water, but a few shifts more will drain it all out, when sinking the shaft will be resumed.

PHIL SHERIDAN.—The machinery is all in first class working order, and work in the mine has been resumed in good earnest.

WEST BELMONT.—Drifting both west and northwest is going ahead finely, with the face of each drift in low grade ore.

(Continued on Page 316.)

Naming the Mines.

How and Why They Received Their Appellations.

The discoverers of bonanzas are getting up prettier names now-a-days for mining claims than they used to when such titles as Puite, Belcher, Mary Ann and Brown were considered good enough. The names given to claims sometimes indicate the individual tastes of the owners and sometimes their nationality. The Mexican was named by a Greaser, and the City of London by a "bloody Britisher." Any one would know that a native of sunny Spain was the original locator of the Dios Senor or the Del Rey. Some military gentlemen thought West Point could be made to pay dividends, and a 49er thought he had "struck it" when he found the Argonaut. The man who bet that Missouri's metropolis was the biggest city in the world now thinks the St. Louis is the richest mine on the Comstock lode. Tam O'Shanter was probably named by an admirer of Bobby Burns, Hector by a reader of the classics, Snustor by an aspiring politician, and Sally Hart by some devoted slave of uncompromising cheek and red hair. The Sullivan was staked off by a son of the Emerald Isle, Germania by a patriotic Teuton, Buckeye by a native of Ohio, Hartford by a nutmegger, Delay by a lazy man, Blue Jacket by an old salt, Lafayette by a Frenchman, Beethoven by a lover of sweet sounds, Plutus by a Hard-shell Baptist, Dexter by a left-handed man, and Burning Moscow by a subject of the Czar. A Third Termer calls his location Grant, and one who helped to "clean out the valley" thinks Phil Sheridan a good enough name. An old miner thinks he has a Prospect of getting rich at last. Rocky Bar and Nigger Ravine smack of old days in California, while Silver Leaf and Brilliant belong to the new order of names. But what matters it after all, whether they are called Ceresus or Poorman, Consolidated or Segregated, so long as they pay dividends or levy assessments? They are bought on margins and sold short just the same, and sooner or later fall into other hands, leaving the first owners poorer than when they began. There seems to be a fatality in the matter, for while a few have been able to hold on to their mines and get away with the profits, the great majority of prospectors and miners lose not only the property itself, but all the money expended by them in its development. —*Gold Hill News.*

THE NEW SILVER DOLLAR.—Morrill, of Virginia, proposes the following amendments to the bill pending before the Senate: To make the weight of the new silver dollar 450, instead of 412 8-10 grains, troy; to make its legal tender limit \$5 in any one payment, instead of \$20; to make the new silver dollar exchangeable by the Secretary of the Treasury for United States notes of denominations of less than \$5, commencing with the lowest, instead of allowing all United States notes to be thus retired; to insert a new section providing that after 50,000 of the new silver dollars shall have been issued they shall thenceforth only be issued in exchange for gold coin, at par; finally, in place of Bogy's amendment to fix the legal relative value of gold and silver at 15 1/2 to 1, Mr. Morrill proposes to make it 17 1/2 to 1.

THE ENGINEER.

Channel Schemes.

How to escape the boisterous channel and go from England to the Continent with level head and quiet stomach is still the problem which engages the European engineers and capitalists. There are now chiefly considered two projects—the tube railway and the tunnel. We propose to give the latest points of these two schemes.

The Tube Railway.

At a recent meeting of the Society of Engineers, London, a paper was read by Mr. Perry F. Nussey, C.E., on the channel railway proposed by Mr. P. J. Bishop, but the details of which were worked out by the author himself. The system consists of two distinct tubes of cast iron, each carrying a line of rails laid on the bed of the channel between Dover and Cap Grisnez, a distance of 21 1/4 miles, at an estimated cost of £1,000,000 per mile. The tube, which is elliptical in section, would be four inches thick, cast in five feet lengths, bolted together by internal flanges, lined inside with brickwork laid in cement, and that cased again with five-eighths inch boiler plate; the outer dimensions 17 feet 8 inches diameter of the major axis, and 14 feet 8 inches the minor axis, the inner diameters being 15 feet and 12 feet respectively. The tube would be sunk in 25 feet lengths, an ingenious water-tight bulkhead being fixed at each end, with a central guide to bring them in juxtaposition for bolting when they are sunk. The bulkheads are removable from the inside, and would be sent on shore in a trolley as the tube progressed, to be used for a fresh section. The operation of sinking would be carried on from a floating pontoon 400 feet long by 100 feet wide, with a central opening 100 feet by 25 feet, surrounded by staging for lowering each section. Plans were shown of the details of this novel scheme, for which the author claimed that it was perfectly practicable, and that it could be completed for this estimate in five years, or, if necessary, in three years.

The Tunnel.

In the latest issue of *Van Nostrand's Magazine* we find some interesting particulars of the engineering nature of this proposed channel tunnel. The distance across the channel at the point selected is about 22 miles, but as considerable approaches will be necessary on either shore, in order to reach the level of the tunnel entrance, the entire scheme will embrace about 31 miles of railway. In the first instance shafts will be sunk on each shore to the depth of 450 feet below high water mark, and, from the bottom of these, driftways will be driven for the drainage of the works whilst in progress, and for its permanent drainage after completion. The tunnel, which will be very similar to an ordinary railway tunnel having two lines of rails, will commence 200 feet above this driftway, and will be driven at an inclination of one foot in 80 to the junction with the drainages driftway, and then at a gradient of one to 2,940 to the center of the straits, where the tunnel from the English shore will meet that driven exactly in the same manner from the French shore, and, being united with it, will complete the submarine railway under the channel. The drainage will be from the center of the tunnel to either end.

In the execution of this work a driftway, nine feet in diameter, will first be carried right through, and this will afterwards be enlarged to the full size of the tunnel. The problem of the execution of the tunnel in a reasonable time has been simplified by the invention of tunneling machinery, and the machine of Mr. Dickenson Baunton, which has been tried on a practical scale by the company in the lower or gray chalk, has been quite successful. The machine works like an auger boring a hole in wood. The chalk is cut off in slices, which break up and fall upon an endless band, which loads them into wagons behind the machine. The apparatus was tried by the company at Messrs. Lee's cement works, Snodland, near Rochester, in the gray or lower bed of chalk, such as underlies the channel. It made a driftway seven feet in diameter, and it advanced at the rate of from a yard to a yard and a quarter per hour. At this rate it would only require two years to drive a driftway of seven or nine feet diameter from one side of the channel to the other, a machine being started from each side. The cost of driving a heading would consist—1st, of tunneling machines, pumps and pumping engines; 2d, the hand labor, which would not be considerable, as the machine requires but few hands to work it; and, 3d, interest on the capital expended during the execution of this work, which might last two years or more. Taking these three elements of expenditure into consideration and according to the calculation of experienced contractors, it has been found that the driftway could be executed for £800,000, if it required only two years to make it.

As soon as the driftway was completed the success of the undertaking would be assured. It would furnish the necessary data for an exact estimation of the cost of the whole work and the time necessary for its execution. In fact, all that would be necessary would be to enlarge the driftway to the dimensions of an ordinary railway tunnel. It has been estimated by some engineers and contractors of considerable ex-

perience that after the driftway was finished, four years' time and four millions of money would complete the work, including the junctions with the English and French railways on either shore. Sir John Hawkshaw and the engineers associated with him, however, think it prudent to double this estimate both of time and of cost, at least until the preliminary work shall have given them the necessary data for a more exact estimate of the duration and cost of the work.

Preliminary steps to test the practicability of the project are about to be put in hand without further delay, for which purpose an English and a French company have been promoted to carry out experimental works on either side of the channel. An act has been passed by the British Parliament during the past session to enable the English company to acquire the necessary lands at St. Margaret's Bay, and it is understood that a *projet de loi* has also been passed in the French Senate to confer the necessary powers on the French company. The works to be undertaken by these two companies consist of sinking two shafts—one on either coast—about 150 yards deep, from which an ordinary mining drifting about half a mile long will be driven under the sea. This work would be a true beginning of the proposed permanent tunnel. Its cost is estimated at £160,000, of which sum it is understood the two companies will find £20,000 each; the Rothschilds of London and Paris have each undertaken to find similar amounts; the Chsmn de Fer du Nord will contribute £40,000, and the London, Chatham, and Dover and South Eastern railways will respectively subscribe £20,000. It may now be confidently anticipated that the commencement of this great work will not be delayed.

A New Bridge Proposed Across the St. Lawrence.

The latest project which comes to us from the important work of bridge building is the proposed "Royal Albert bridge" across the St. Lawrence river. The April number of the *Canadian Mechanics' Magazine* contains full drawings, specifications and bird's-eye view of the structure. The engineer whose design is illustrated is Mr. Charles Legges.

The total length of this bridge and viaduct will be 15,500 feet, or within a fraction of three miles; and the extreme distance covered from the point of departure from the Quebec, Montreal, Ottawa and Occidental railway on the Mile End heights, to the junction with the line on the south side, will be five-and-a-half miles. A sufficient length on the natural surface of the ground on St. Helen's island exists between the two bridges for siding purposes. Trains from opposite directions can thereby cross each other here, and so double the capacity of this bridge. The piers to be placed in the two channels of the river will be designed on the general principles of those of the Victoria bridge, for the purpose of allowing the ice to cut freely past. Those in the navigable channel will be sunk in caissons, thereby obviating the use of cofferdams and other obstructions in the river, and rendering pumping unnecessary. In the south channel the water is very shallow, with a rock bottom, and very little expense will be incurred in putting in the foundations of the piers. The abutments and piers on the land portion will be of simple design, the first probably partaking of the Egyptian style.

The iron superstructure from end to end will be composed of four independent longitudinal ribs, or open lattice girders, placed certain distances apart, and strongly connected laterally. These ribs will be provided with the usual friction rollers on each alternate pier, to provide for expansion and contraction. Between the two inner girders, on the lower floor, will be a space of 18 feet to accommodate two tracks or trains of city cars, to be drawn by dummy engines. Between the two inner girders and outside girders, on either side of the bridge, will be spaces of 14 feet respectively, for ordinary cart and wagon traffic, passing in one direction on the western, and in the opposite direction on the eastern side of the bridge. Exterior to these two outside girders will be footwalks, firmly supported on brackets of iron, strongly attached to the side girders and floor beams; they will each possess a width of eight feet and be provided with ornamental railing for the protection of pedestrians.

At a distance of 15 feet above the lower floor will be placed a second one, strongly connected and braced with iron kelsons and gussets to the longitudinal girders; on the floor, between the two inner girders, will be placed a railway track with crossing arrangements for trains, as before stated, at St. Helen's Island. The apices existing between the inner and outer girders will each possess the width corresponding to the carriage-ways below, and are intended for carriages and other vehicles requiring a higher rate of speed than carts or wagons. Should a second track ever be required for railway purposes, across the entire length of the river, a fifth girder can be erected on the upstream side of the bridge, and be supported by iron columns from the saddles of the ice-breakers, at a comparatively small cost.

The entire height of the bridge from the surface of the water will be 210 feet for the centre span, or 250 feet from foundation.

A LITTLE strong soap lather mixed with the starch will prevent flat irons sticking to linen.

USEFUL INFORMATION.

Gilding on Exposed Ironwork.

Some of our foreign exchanges have been discussing the use of gilding upon exposed iron work. One of them takes the ground that the only result of gilding can be the destruction of the iron, gold standing at the head of the electro-negative bodies, and powerfully tending to promote the destruction of iron when the two are in contact in the presence of air and moisture. The gold size by which the gold is held in place, the paint beneath and the gold itself are supposed to be so mere network permitting the air and moisture to find their way to the surface of the iron beneath, and thus to establish a chemical action which destroys the iron. Theoretically this is very true, but the case has not been fairly stated. The paint when first put on is not porous, and, until the action of the air decomposes them, they prevent air and moisture from coming in contact with the iron. As they decay they become porous and air and moisture find ready entrance. Gold, so commonly applied to iron, is put on over a coating of gold size applied on top of the paint. The iron in this manner gets a much better protection than it could otherwise have. The gold is next applied, and serves to protect the paint beneath, and, if well put on and of fair thickness, will preserve the paint and size much longer than they would last if exposed to the weather. Now, as long as the gold preserves the paint, the gases or moisture in the air will have no opportunity to attack the iron, and so the galvanic action so much dreaded will have no opportunity to begin. Gold leaf, as commonly used for such purposes, is very thin and usually falls off holes; in time the air acts upon the paint through these, and so reaches the iron, when, of course, the action is rapid. But it is to be noted that the action of the air is greatly retarded, and a gilt surface of iron in this climate lasts much longer than one simply painted. We apprehend that more trouble has arisen from a poor quality of gold, easily destroyed by the weather, than from gilding done with real gold leaf of good thickness, well laid. The poor leaf yields to the action of the weather, the paint beneath is then attacked and the destruction of the iron rapidly follows, whether there is any galvanic action or not. We look upon gilding as a very desirable method of ornamentation, especially when well done, and think it just as safe as painting in any event.—*Iron Age.*

How to Make a Good Scarecrow.

Crows are possessed of much more wisdom than is generally credited to them; and while an immovable bundle of rags may drive them away for a short time, we believe that eventually they discover the humbug, as we have seen the birds complacently picking up young corn almost within the shadow of an elaborate stuffed scarecrow as ever erected. We, however, have heard suggested a couple of plans which are calculated to intimidate even the boldest of these birds; and as they are easily carried out, perhaps our farmer readers may make use of them. The first and best is a suspended looking glass. Take two small cheap mirrors, fasten them back to back, attach a cord to one angle, hang them from an elastic pole. When the glass swings in the wind the sun's rays are reflected all over the field, even if it is a large one; and even the oldest and bravest of crows will depart precipitately should one of its lightning flashes fall on him. The second plan, although a terror to crows, is especially well suited to fields subjected to the inroads of small birds and even chickens. It involves an artificial hawk made from a big potato and long goose and turkey feathers. The maker can exercise his imitative skill in sticking the feathers into the potato so that they resemble the spread wings and tail of the hawk. It is astonishing what a ferocious-looking bird of prey can be constructed from the shoddy simple materials. It only remains to hang the object from a tall bent pole, and the wind will do the rest. The bird makes swoops and dashes in the most headlong and threatening manner. Even the most inquisitive of venerable hens has been known to hurry rapidly from its dangerous vicinity, while to small birds it carries unmixed dismay.—*Scientific American.*

Novel Cork Leather.

G. E. Block, of London, Eng., writes: I take sheets of cork, and apply, with a brush, to one side of them a coating of india rubber solution. When dried, I apply a second coating. I then take a piece of japanned cloth, canvas, thin leather, or other such like fabric, and similarly coat it at the back with two coatings of the solution, and then place the coated surfaces of the cork and fabric together, the edges of the pieces of cork being fitted together neatly, so as to form a continuous sheet or layer. The uncoated side of the cork, and also another piece of linen, cotton, or other fabric, are now similarly coated with two coats of the solution. When the coatings upon the cork and linen are quite dry, the coated surfaces are applied together, and the cork, now coated on both of its sides, is submitted to considerable pressure in a press or stamp, or by rollers.

In order to cause the coated surfaces of cork and fabric to adhere firmly to one another, it is better that the pressure should be applied sud-

denly, as by a blow, or by stamping or rolling. The two coatings of cementing solution which are thus brought together blend and form a perfect skin, which will bend at will, and which can be turned in any way, and yet always return to its original form without breaking.

As each of the coatings of cementing solution has been allowed to dry before bringing them together and submitting them to pressure as above described, the solution will not penetrate the outer surfaces of the fabric or material and spoil their appearance.

Uses of Mustard Seed Oil.

R. Rother, in the *Pharmacist* for April, calls attention to mustard seed oil as being well adapted to the preparation of all the official ointments, cerates and plasters, to the exclusion of lard or other glycerides which are changeable and unsatisfactory.

A mixture of three parts of mustard oil, one part of spermaceti, and one part of yellow wax, is in every way superior to the official simple ointment. The spermaceti in this mixture is not essential, as three and one-half parts of oil and one and one-half of wax answer equally well. When substituted for olive oil in cerate of sub-acetate of lead, the yellow color disappears after a few days, and the cerate becomes white. The main advantage, however, lies in the fact that the preparation does not become rancid.

Resin cerate, of a superior quality, results from a mixture of 14 parts mustard oil, 12 parts resin and four parts yellow wax.

Ointments containing ingredients liable to change under the influence of lard or olive oil, as, for instance, ointment of iodide of potassium, or rose water, are properly prepared with mustard oil. The ointments of sulphur, carbamate of lead, and oxide of zinc, retain a smooth grain and the appearance of freshness perfectly, when prepared with mustard oil.

GOOD HEALTH.

The Sanitary Side of Soap.

In the *Sanitarian*, L. D. Bulkley, M. D., writes: The subject of soaps for the toilet is one of very great importance, and one which our sanitary authorities would do well to take in hand, when we consider their enormous consumption on the one hand and the practical facts in regard to their manufacture on the other. It is no idle matter what one rubs on and into the skin, and it is a very frequent occurrence to have ointments which, when fresh, are not only harmless and unirritating, but even soothing, become most pernicious by having turned rancid. What shall we say, then, in regard to the fearful decomposing masses of animal fats which go to make up the soap manufacturer's stock, and which are returned to us colored and perfumed as the finest toilet preparations? It is true that the fats, in order to become saponified, undergo a disintegration with the alkali, but this is quite a different affair from the decomposition which takes place in the family refuse jar, whose contents find their way through the soap-fat man, and those to whom he sells, back again into our bedrooms to cleanse our persons with.

We know scientifically that certain specimens of soap, when submitted to microscopic examination, have been found to contain pus cells, and other minute spiculae of bone, other fragments of animal connective tissue, etc. These examinations have been instituted on occasions when eruptions on the skin have been found to persist and recur with the use of a particular kind of soap; and I doubt not but that, if time could be spent at it, the same foreign elements could be found microscopically in very many of the samples of our soaps now in most common use. There is no doubt but that many cases of diseases of the skin are thus originated, and many more kept up indefinitely by this cause, and I could readily cite examples in support of this assertion.

I have written thus at length because I believe there is a remedy, and that is in the use of soaps made either from the vegetable fats and oils or from those of fish—that is, if they are used in a fresh state. As an example of the former we have castile, almond and palm soaps—of the latter the potatoe oil soap of the Germans (*sapo viridis*), which Hebra has made famous for the treatment of skin diseases; the former being made, as is known, of olive, almond and palm oils respectively, combined with soda; the latter of spermaceti, or cod liver oil and potassa, although all these articles are undoubtedly subject to adulteration, the refuse animal oils and fats being much cheaper than the proper constituents.

How Vegetation Affects Health.

The *English Gardeners' Magazine* says: Our instinct leads us to delight in flowers. Their beauty and perfume have irresistible attractions for us. We have little dreamed that we were thus led to surround ourselves with objects which most powerfully conduce to health. No doubt there are certain members of the vegetable kingdom which are exceedingly deleterious; for, not to speak of the much dreaded upas, the West India manchineel and some of the American rhus, there are some of our common sweet scented flowers, such as the mezerion, which have very injurious properties. But recent investigation has proved that those

adornments of our gardens, for the presence of which we so crave, are as a rule endowed with health preserving qualities. Oxygen, when highly electrified and so rendered especially vitalizing, has in recent times been distinguished by the name of ozone. This is one of the chief elements of a healthy atmosphere. Now, centuries ago it was known that certain plants acted as powerful disinfectants. Thus Herodotus tells us that, when in the second century the plague raged in Italy, the physicians recommended those who crowded into Rome to go to Laurentum, because there the sweet bay tree (*Laurus nobilis*) grew in great abundance, and the inhalation of air impregnated with its odors was a strong preservative against infection. And the disciples of Empedocles were wont to grow aromatic and balsamic herbs around their dwellings, from the belief that they were thus guarding themselves against fevers,agues and such like. Hae not, too, among us the tradition of its fever dispelling power given the name of feverfew to one of the strongest scented of the composite? Recent investigations, especially those of Prof. Montegazza, of Padua and Dr. Cornelius Fox, have shown that these old ideas were based on scientific truth. It is now ascertained that the quality of ozone is materially increased by the exposure to the rays of the sun of various plants, among which the most common are the lavender, musk, cherry, laurel, clove, fennel, narcissus, heliotrope, hyacinth and mignonette. It is interesting to know that the sunflower, which will grow almost anywhere, and could be turned to various useful purposes, is one of the most valuable of sanitary agents, since not only is it ozoniparus, but also destroys deleterious miasmata. It should be noted as a further proof of the good influence of plant culture on health, that while the manufacture of ozone is an independent work carried on by the flowers alone, the green leaves are performing their sanitary function by extracting carbonic acid gas from the atmosphere, and helping to reserve that proportion in its elements which makes it healthful. More remarkable perhaps than all is the eucalyptus, of which we have recently heard so much, and of which we shall soon know more. Thus the cultivation of flowers is a work not merely delightful and humanizing in itself, but one which, in a way most beautiful and picturesque, confers a positive benefit on society, so great that it can hardly be overrated, especially in large towns where there must necessarily be so much to poison and deteriorate the air we breathe. It may be added that the sunflower thrives even in the heart of London, and that it is readily propagated from seeds sown in March or April. It is nearly allied to the common Jerusalem artichoke, which grows in the remotest of districts.

Disease Germs.

Mothers know too well what is meant by the word "thrush" or "screw," that mouth malady which is so common with little children. To the profession it is known as an aphthous ulceration of the tongue, sphtha being the name of the disease, and signifying a hurting. The tongue "is swollen, tender and furred." There are excoriated spots, sometimes true ulcers, varying in size, perhaps, from that of a pin's head to that of half a pea, and these are severally capped with a white, curd-like mass. However diminutive these pustules may be, they are in truth hammocks of tiny plants, for each one contains many thousands of parasitic fungi, often called *torula*. These fungi attach themselves to the mucous membrane, and burrow among the epithelial cells. They are "composed of threads matted together like felt," whose basal ends intertwine among the epithelia, like the hair in the prepared mortar of the plasterer. At a recent meeting of the Academy of Natural Sciences, Prof. Leidy exhibited a mouse with little curdy patches on its ears, face and nose. Mr. Indifference would have passed the matter by as a stupid trifle; and a report of insipience escaped one of the wise men, who wished to know "what the mices was." However, little *Mus musculus* was regarded as an abnormal case, and a proper subject of scientific inquiry. The query was now, "What ailed the little fellow, and where had he been?" At this juncture the microscope spoke out in meeting, declaring with authority that the white spots were colonies of a parasitic fungus; and, strange to tell, they were as much like the thrush fungus as one pea is like its fellow in the same pod. The truth told, Mousie was captured in the children's department of Blockley hospital, where he had picked up the crumbs that had fallen from the mouth of a child patient. The diagnosis now seemed natural and direct. Mousie had been and got it—namely, the thrush—and, strange to say, he had got it bad, for it was on his ears and nose and face. Soon, in all probability, it would have entered the mouth, even if it had not already. A minute portion of one these white spots was subjected by skilled hands to a lens of very high power, and lo! there were the morbid parasites, tiny sporular bodies, some single, some double, and others "in chains of a dozen or more." The fungus was pronounced to be a *torula* or *oidium*, like that found in the disease known as thrush or sphtha. A drawing of it would be simply like a number of elongated heads strung together. But how diminutive these heads or cells were! A single one was 1-650 of a line in length, that is, it would take 7,650 of them in a line to make an inch.—Prof. Samuel Lockwood, in *Harper's Magazine* for May.

DOMESTIC ECONOMY.

How to Set a Table.

In answer to a question, a lady writer for the *New York Tribune* gives the following directions for "setting a table" and table etiquette generally. She writes: There is no arrier test of refinement in persons or families than the manner and style in which their food is served and eaten. Absolute and thorough cleanliness is the first requisite in the preparation and serving of food. Next to that may be placed taste and judgment in the arrangement of the table and the succession of courses. But, leaving all side issues, let us attend simply to the question in hand, "How to set the table." In the first place the sides of the table should be parallel with the sides of the room. It is simply distressing to a person with an eye to symmetry to have the table "askew." In the next place the tablecloth, which should be clean, white and nicely ironed, must be put on so that the middle of the cloth will be in the middle of the table and the folds of the cloth be parallel with the sides of the table. The plates are usually placed around the table and turned down to prevent any dust or other defilement from soiling them. Often, however, when they have been in the warming oven they are placed in a pile before the host, and after being served, headed to each guest. At the right of the plate, at right angles to the side of the table, is the knife, with the edge of the blade turned from the plate; parallel with that is the fork, with the tines turned down. The handles of the knife and fork are an inch or two from the edge of the table. Parallel with the edge of the table at the side of the plate opposite the guest is the spoon, with the bowl turned down. The napkin is sometimes placed at the right of the fork, sometimes on the plate, sometimes folded in fancy style and put in the goblet, but all the napkins on the table are in the same respective position. At the right-hand corner of the plate is a little butter receiver, of glass or of china, and a salt cellar. All the butter plates are in line, all the salts in line; so of the glasses or goblets, which are near the salts. In the center of the table is the center, or in its stead a vase of flowers or fruit. On one side of these stands the butter; on the other saucers in bottles, pickle and relishes. In the waiter at the end of the table occupied by the hostess, at her right, are coffee cups and saucers, at her left those for tea; the claret-basin and milk pitcher are at the left, the cream and sugar basin at the right. The tea and coffee are served in urns or pots and placed in front of the hostess. In this position they are not likely to burn the hands of the one at the right of the hostess. Bread is placed at the left of each plate, or laid on the plate, or nicely cut in slices and set on a bread plate at each end of the table. Soup is always served by the host. Fish is also served by the host, unless there are two kinds, when he serves the boiled fish and the hostess that which is fried. At the top of the table is placed the roast, at the bottom the stew. Where there is but one principal dish it is served by the host. If there are three, one is placed before him, the others opposite each other near the bottom of the table. Vegetables and other dishes occupy positions between the principal dishes. As each dish is set on a mat, and if for a time removed and returned to its place again, the table once properly set is easily kept in order till the repast is over.

Puddings and pie are generally served by the hostess. It is a good plan in teaching children and servants how to set a table to draw a diagram of the table with all the dishes in place and write down the names so that everything will be plain. Paste this on the inside of the closet door and then offer a suitable reward for perfect conformity of the table to this plan. The point to be made is uniformity in setting the table, that everything shall be precisely in its place every time. The very look of a well-set table is appetizing, and when, in addition to this, the air of the dining room is sweet, the walls are pleasantly decorated with pictures, the chairs are comfortable, the hostess is lovely, sweet-voiced and hospitable, the most languid appetite is stimulated and every sense is gratified. The table may be decorated with flowers or fruit, one or both. If there are neither, napkins of delicate tints relieve the white. They may be placed in the bread tray or the cake basket, though white is usually preferred. In some of the best families of the South, breakfast and tea are always served without a cloth, on a handsomely-polished mahogany or black walnut table. Under each plate is a napkin fringed and worked in cross stitch with scarlet cotton where the fringe ends. Mats of white crochet with scarlet edges, receive the dishes and contrast with the dark brightness beneath them.

CAULIFLOWER.—Soak the head two hours in cold salted water, and boil till tender in plenty of water. Have the water boiling when you put in the flower. Pour off the water and add a cup of cream or milk. Rub together a teaspoonful of butter and a large spoonful of flour. Stir into the milk, season as you like, and let all boil up together for five minutes and serve.

OAT MEAL AND GRAHAM GEMS.—Mix equal parts of fine Irish oat meal and graham flour into a thick batter with milk and water equal parts, fill hot gem irons and bake with a brisk heat. Very sweet and tender.



W. B. EWEY,..... SENIOR EDITOR.

DEWEY & CO., Publishers.

A. T. DEWEY,..... GEO. H. STRONG
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Office, No. 224 Sansome St., S. E. Corner
of California St., San Francisco.

Subscription and Advertising Rates:
ADVERTISING RATES.—1 week, 1 month, 3 months, 1 year.
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Prompt Subscriptions.

We wish to thank those subscribers who send in their renewals to the Press promptly as regularly as the year comes round. It saves us much expense in commissions for collections and renewals. May we not request more of our good patrons to do so!

THE ORIGINAL ARTICLES in this paper are mostly set in solid type, giving in our columns one-third more reading than is contained in ordinary leaded matter.

Our latest forms go to press on Thursday evening.

San Francisco:

Saturday Morning, May 13, 1876.

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NEW ADVERTISEMENTS.

Sulphuret Concentrator, Schofield Concentrating Co., S. F.; A. L. Fish & Co., Dealers in Machinery, S. F.; Amador Canal and Mining Co.—Assessment.

It is said that there are peculiar circumstances attending the terrible explosion in Bergen tunnel Saturday night which point to strikers as the perpetrators of the fiendish deed. Out of 600 men employed there are 550 on a strike. The strikers made a demand for increased compensation on Saturday, but only a partial concession was made. Mr. McIntyre, one of the bosses, says the strikers are a branch of the "Molly Maguires," and he can prove it. The theory of the police as regards the explosion is of a similar character. They think the strikers had placed cartridges or fuses in the building. No direct evidence has been found against the strikers. The injury to Jersey City will be about \$350,000; Hoboken, \$150,000.

Six of the largest print mills in Massachusetts and Vermont have failed, with liabilities aggregating over a million of dollars. They ran in all over 1,000 looms on print goods. Some 800 people have been thrown out of employment. The failure has created much stir among commission merchants in New York, several large houses being heavily involved.

The Mechanics' Institute has elected W. P. Stont, J. R. Wilcox, B. H. Freeman, J. H. McDonald and D. R. Coleman, a committee to nominate Trustees. They are to report on Saturday, June 3d. The election comes off on June 5th.

CITY AGENT.—Mr. E. B. Hopkinson is our authorized agent for receiving subscriptions in San Francisco.

The Inter-Yubas Ridge.

It would be difficult to find an area of territory that has produced so large a number of profitable gravel claims as that lying between the South and Middle Yubas, extending from French Corral upwards for some 15 miles to North Bloomfield, in Nevada county.

This region covers an area of about 50 square miles, and lies in the townships of Bridgeport and Bloomfield, and may justly be regarded as one vast bed of auriferous deposits. From incidental causes the year 1875 was an exceptionally poor one, yet the "ridge" is reported as producing about one million and a quarter in gold dust. South and north of it, running in canons 1,000 feet deep, the classic North and Middle Yubas rattle along over their gritty beds of gravel and boulders. Very different are they to-day from what they were as seen by the Argonauts of '49. Then, fed by the snows of the Sierras and the streams of the hillside, their limpid currents rolled sweetly on in a deep and crystal tide—to-day with their sources cut off by a hundred ditches and sluices, they appear, even in winter, as turbulent but muddy and insignificant streams—leaping with break-neck speed from boulder to boulder, bearing with them the inevitable "sickens," which so badly "sickens" the ranchman far below.

Two hundred and fifty miles of ditches now convey the waters that once drained into the Yubas, "Over hill, over dale, through the brush, through the briars," across deep cuts and high flumes, to supply the miners along the way with the indispensable aid in securing their treasures. Among the more important operations carried on in this region are the mines of the American company, the Milton company, the Bockeye company, the Badger Hill company, the Consolidated mining company, North Bloomfield company, Union gravel company and a score of others.

As would be expected, all along the ridge, contiguous to the principal mines, are to be found a number of villages with populations ranging from 500 to a score. The most important of these little towns is North San Juan, which contains several fine stores, a banking establishment and a weekly paper—the *Times*. This last is a popular, wide-awake sheet, edited by Judge O. P. Stidger, a well known lawyer. French Corral is a famous mining town, a few miles below San Juan. The principal owners here are the Milton company, who conduct very extensive operations and own mining property of immense value. Last year this company shipped almost \$200,000 in gold. The American company, near San Juan, is another very prosperous corporation. This company is at present running a new 4000-foot tunnel, which, when completed, will add vastly to the value of its claims. No less than 52 modern currents are operated in these works. The corporation is very popular, as it mostly consists of residents of the neighborhood and employs only white labor.

All along from French Corral to San Juan the bottom of the detrital deposits is no less than 900 feet above the level of the river. Because the lower parts of these deposits consist of granite, quartz and the metamorphic rocks of the Sierra Nevada, cemented together in a compact mass, and often of a bluish color, this hydraulic belt is often confounded with the "Great Blue lead." In fact, however, this and other deposits in this neighborhood are a continuation of a Sierra county river bed, which runs parallel with the Blue lead, the latter running several miles eastward of the former, from Snow Point to Yon Bet, and thence through Placer county.

Cherokee stands on the verge of a plain of auriferous soil containing no less than 3,000 acres. In the early days this proved literally a "gold mine" to surface placer miners. It is yet very rich, but for the most part worked out of grade. The bedrock in some places is so deep that no shaft has yet been sunk to reach it. Recently the Milton company have procured interests here to the amount of \$83,000. We believe they propose to shortly run a snail-like outlet by way of tunneling to the Middle Yuba. In Doolittle's charts this flat appears as an ancient river "overflow," but its course so far has not been very well defined. Several smaller claims in this neighborhood are worked on a paying basis.

From Cherokee to North Columbia, a distance of some four miles, extends a chain of very rich mining claims, the Consolidated company holding a just prominence in the energy and skill which stamps all its operations. Its monitors and methods of application, if not the best in the State, are certainly among the best. Indeed, to a tourist anxious to see the "Niagara" of hydraulic mining, we would say, "go and see the monitors of the Consolidated mine at North Columbia." It is impossible for one who has not witnessed it to form a correct idea of the effect produced by a 200-foot pressure forcing an enormous torrent of water against these gravel precipices, which seem to actually melt away at its icy touch.

There are other operations in this locality also well worthy of special notice, which we cannot notice in this article; and further on, the North Bloomfield gravel company and others carry on very important and withal profitable operations.

Traveling from San Juan to Moore's Flat is to ascend from the foothills to the Sierras, and

yet the grade, for the most part, is so gradual as to be hardly perceptible. In the absence of the barometer, it is only by the change in the climate that we can tell how great a difference is produced by so short a distance as 16 miles. In San Juan the snow seldom lies on the ground longer than 24 hours, while at Moore's Flat they have continuous snow to the depth of 10 or 12 feet for four or five months in the year. As may be expected, the "Moore's Flatters" are no "flats" when it comes to running on snowshoes.

Besides the gravel mines there are several fine ledges of quartz running through the Inter-Yubas ridge. Owing to the Fryer process excitement, there have been a large number of quartz claims located within the last few months. Gravel miners, however, "don't go a cent" on quartz, and ridicule their brethren of a harder fancy. Of one thing, however, there can be no doubt: if the Fryer process is the success it affects to be, then this ridge will prove far more valuable for quartz mining than it ever did for deep placer, and that is saying a great deal.

The prospect for the coming summer is better than it has been for years. An abundance of water and plenty of "pay dirt" are here, and these are the elements of success to the rollicking hydraulicers.

Schofield's Sulphuret Concentrator.

The subject of "sulphurets" is one of vital importance to the miners of this coast, as in a large proportion of mines the saving and working of the sulphurets determines the question of profit or loss in the venture. This being the case, great attention has been paid by metallurgists to appliances for saving the sulphurets as well as processes for working them. The most important of these subjects is naturally that of saving the sulphurets, which are scattered in minute particles through a large quantity of ore. As the sulphurets will not amalgamate, the process of concentration has to be resorted to. This may be called a science in itself. The great number of different machines which have been invented for effecting it is sufficient proof that it is not in all cases an easy task to accomplish.

All apparatus for the purpose is essentially based upon the fact of the different specific gravities of the substances to be separated. This would seem at first glance to be a very simple affair, but it is not, by any means. The great variety of size and shape complicates the problem. Particles of different specific weight, but of the same actual weight, will, if of the same shape, go together. But the difficulty in the way of constructing a perfect concentrator is that there are so many differences in size and shape in the same gangue. The presence of the slimes also seriously complicates the problem and is an item to which sufficient attention has not hitherto been given. The steps in a perfect concentration are, first, the entire separation of the slimes from the granular matter; second, the sorting of the various particles, and lastly, the concentration of the sulphurets from the sands. Volumes have been written on the subject, innumerable experiments tried, and a multiplicity of mechanical devices constructed to effect a perfect concentration.

The latest device for this purpose which has come to our notice is the "Schofield sulphuret concentrator," a California invention which is just now being brought prominently before the mining community. We examined two of these machines this week, which are being built for the Oneida mining company, Amador county, and the plain description which we give can be readily understood by mining men.

The concentrators are quite simple in construction and operation, there being no complicated machinery about them at all. They are constructed mostly of wood, and consist of two or more hopper-shaped boxes placed over a tank with four compartments, and as many small sluices three or four inches in width and 60 feet in length, leading from the above tank to another below, which latter is divided into two compartments. A few inches above the real bottom of the hopper-shaped boxes is a false bottom, composed of a screen of perforated sheet iron, beneath which is inserted a pipe conveying clean water from a tank above with at least 10 or 12 feet pressure. Immediately over and close to the false bottom are three perforated pipes through which the main portion of the water passes. A steady upward stream of water passes from these perforated pipes with sufficient pressure to prevent any light and worthless matter from passing downward through the screen against the upward current. The pipe under the screen is for throwing fine upward streams against the false bottom to prevent any chance of packing and closing the perforations. Moreover, a stream from this lower pipe can be turned on over the collected material at the bottom to prevent packing and aid in discharging the sands.

The pulp is conveyed from the battery through a sluice into the top of the first box, and all the coarse heavy sand and most of the sulphurets pass down through the screen and out through the discharge cocks into the tank below, but all sand and sulphurets which are too fine and light to resist the upward current

of water in the first box, pass on into the next box, and go through the same trial again under a diminished pressure of water, which results in abstracting a finer quality of sand and the remainder of the sulphurets. The quicksilver and amalgam stops in the bottom of the first box. Quicksilver is placed under the false bottom of both boxes, in order to collect any particles of gold or small grains which may have passed the ordinary mill process. The slimes are separated and pass over the edge of the box with the waste water, thus being one of the most important features of this concentrator, and one generally overlooked in previous machines.

When one or more apartments of the tank beneath the boxes are filled with sand, plugs are removed, which let the sand flow into the small sluices, and a small stream of water is applied, which, with the sand, forms gentle undulations or sand riffs, which continually work the sulphurets down to the bottom, but carry the sand out at the end of the sluice over the lower tank. When all is out of the upper tank which will conveniently flow out, the plugs are replaced and the stream of clear water continued until the sand is all washed out of the sluices; the sulphurets are then carried by a stronger current and let out through a gate in the bottom of the last sluice into the tank below.

It will be seen from what has been said, that this machine effectually separates the slimes from the sand at the very first operation, none of them ever getting even into the first tank under the hopper-shaped boxes. By graduating the flow of water from the perforated pipes over the false bottom, advantage may be taken of the very slightest difference in specific gravity of the particles in the material under treatment. The sluices are narrow and deep, and when closing up a clear stream of water may be sent with more or less force through the sluices and drive off all the lighter portions, leaving the sulphurets perfectly clean.

This apparatus requires no power whatever, the only thing necessary being the amount of water which will pass an inch and a half pipe under a twelve foot head. There being no motion or complicated machinery, there is no perceptible wear or tear, and the appliance will last for years. The first cost is comparatively small, and the labor and expense of running is very light, one man being able to attend to it for a twenty-stamp mill. It answers the purpose, as well as a sulphuret concentrator, of saving what gold and amalgam escapes from the battery. The manufacturers claim that it saves a larger percentage of valuable material from the sands than other machines, and offer a guarantee of saving ninety per cent. of the sulphurets contained in the rock.

Although Schofield's sulphuret concentrator has been in use in several places in California for over a year, it is only now becoming well known. The inventor has preferred to give it good practical trials before endeavoring to introduce it extensively, and judging from the strong testimonials obtained it has been entirely successful.

We refer to the advertisement on page 317, for testimonials containing the names of the various mills where it has been in use, and the opinions of the superintendents, so that parties interested in it can write to those who have used it practically, and obtain whatever further information may be desirable. The office of the Schofield concentrator company is room 59, Nevada block, in this city.

The Centennial.

The stirring event of the week throughout the whole country is the opening of the grand display at Philadelphia, of which we present a telegraphic report in another column. The report tells us that the President of the United States turned on the steam which set 14 acres of machinery in motion. It is a grand thought. It stirs the blood to think of such an expanse of useful machinery sounding the note of industrial and mechanical progress. But need we go to Philadelphia to gain material for a stirring thought? No. Right at our doors, in our magnificent grain fields, will soon begin a motion of valuable machinery, which, if we collect into a single thought the thousands of our harvesters and the varied machines they employ, will far surpass the figures of the Philadelphia action, whether the computation he made in trial and mechanical progress. Yes, we are content that the nation should revel in the grandeur of the industry symbolized in Philadelphia. We are proud of it, too, and we are doubly happy in the year. Whi amid the hardship and depression at the East, (which we most sincerely deplore), they are looking toward Philadelphia, if perchance its occasion may cast some enlivening influence upon their clouded industries, we, from out the grandest prosperity and promise, look abroad upon the coast, and in the activity here displayed, see reflected all the life and industry which fills those Eastern halls. The Centennial is advanced as an occasion for rejoicing. We have then two Centennials, one here, the other in Philadelphia.

The managers of the direct United States cable announce that no increase will be made in the rates charged to the public or press. The interruption of the Anglo-American cables has greatly increased the volume of business over the cable of the direct company, but business is being transmitted as promptly as possible.

Pay Chutes in the Comstock Lode.

EDITORS PRESS:—Permit me in your columns to call the attention of the mining community to the important question of the distribution of the valuable minerals in lodes bearing gold and silver. To illustrate my ideas I have prepared the illustration given herewith from a diagram on Parkinson's map of the Comstock lode, showing a vertical section of the lode, drawn on a scale of 1,200 feet to one inch. The proportions may not be observed accurately, but precision is not necessary for my purpose. The top line represents the elevation of the ground on the line where the lode comes to the surface. The bottom line is about 2,400 feet below the surface, and the marks on it are intended to indicate the limits of the separate mining properties, which, beginning at the north, appear in the following order as numbered on the diagram:

MINES.	LENGTH IN FEET.
1 Ophir.....	675
2 California.....	600
3 Consolidated Virginia.....	710
4 Best & Belcher.....	636
5 Gould & Curry.....	617
6 Savage.....	771
7 Hale & Norcross.....	400
8 Chollar Potosi.....	1400
9 Bullion.....	943
10 Eschschuer.....	400
11 Alpha.....	306
12 Imperial-Empire.....	685
13 Yellow Jacket.....	357
14 Keweenaw.....	93
15 Crown Point.....	541
16 Belcher.....	1008

The white lines running down are the shafts and inclines by which the veins have been opened. The lighter spots in the vein indicate the places where the rich ore has been found;

the direction in which they may hup to find another pocket.

12. The wider and richer the lode, the longer horizontally are the pay chutes as a general rule. The main measure of the size of a pay chute is its horizontal length. All pay chutes in fissure lodes run down to a depth beyond the reach of practical working.

13. The chief business of the gold and silver miner is to find and follow pay chutes.

14. The money spent in exploring lodes outside of the pay chutes gives no return.

15. Many millions have been so spent in the Comstock lode.

16. All the dividends of the Comstock lode have been paid by three pay chutes, each nearly half a mile long horizontally, with barren intervals of a third of a mile between them horizontally, and half a mile vertically.

17. One of these pay chutes has produced \$50,000,000, one \$80,000,000, and the third may be set down with past production and ore in sight for at least \$350,000,000.

18. Each pay chute has mineral or chemical peculiarities distinguishing its ores.

Although we have repeatedly mentioned this theory of pay chutes in the *Alta* and called public attention to it, yet it has been passed over as if there were no facts to support it, and mining superintendents and engineers generally seem to attach no importance to it; and they make their plans, run their shafts, tunnels and drifts, and spend their money as if there were as much probability of finding ore in one part of the vein as in another, even after the situation and direction of pay chimneys have been well determined.

In the second annual report of the Commission of Mining Statistics for the year 1867, (submitted to the Secretary of the Treasury in March, 1868,) mention is made of pay chimneys in the following gold mines in California, viz: The Pina Tree, Coward, Marble Spring, Goodwin and Mary Harrison, in Mariposa county; the App, Soulsby, Platt, Mt. Vernon,

The Opening of the Centennial Exposition.

We have received by telegraph on Wednesday, the 10th instant, quite a detailed report of the successful opening of the Nation's Grand Centennial Commemorative Exhibition at Philadelphia.

The gates were opened a little after 8 o'clock, and crowds continued to pour in until it was estimated that 50,000 people were on the grounds. The ceremonies opened at precisely 10:15 A. M., the national airs of all nations being performed by a large orchestra.

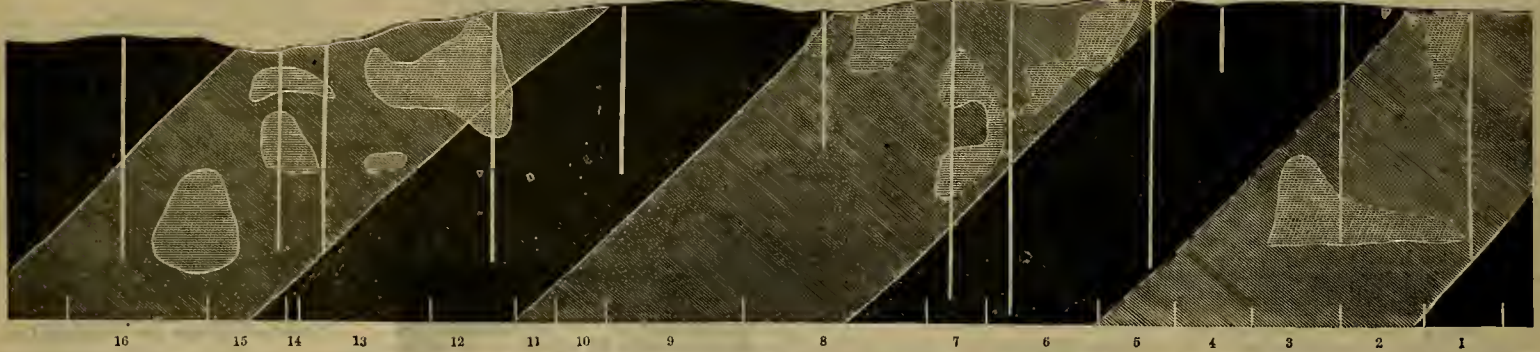
A spacious platform had been erected at the side of Memorial hall, north of the center of the building. Seats were arranged on the platform for officials and other invited guests. At the right of the center were seats for the President of the United States and members of the Cabinet, and further to the right seats of the United States Senators and members of the House of Representatives, Governors of various States, etc. On the left center were seats of the United States Supreme Court, and further to the left, seats for the Diplomatic Corps and members of the Centennial Commission, Board of Finance, Woman's Executive Committee, Foreign Commissioners, Mayor, Council and other officials of Philadelphia; Mayors of other cities, State Centennial Boards, Boards of Awards, Judges, yacht and rifle clubs, and along the front of the platform were seats for members of the press. The orchestra of 150 pieces, and chorals of 1,000 voices, under the direction of Theodore Thomas and Dudley Buck, were stationed directly in front of the platform.

As the Emperor of Brazil and party came to the platform they were loudly cheered, and the orchestra played the Brazilian national hymn.

At 10:45 the signal was given for the music to stop, and five minutes later the President, escorted by General Hewley, advanced to the

appropriate upon this Centennial occasion to bring together in Philadelphia, for popular inspection, specimens of our attainments in industry, the fine arts and literature, science and philosophy, as well as in the great business of agriculture and of commerce, that we may the more thoroughly appreciate the excellencies and deficiencies of our achievements and also give emphatic expression to the earnest desire to cultivate the friendship of our fellow members of this great family of nations. The enlightened agricultural, commercial and manufacturing people of the world have been invited to send thither corresponding specimens of their industries to exhibit on equal terms in friendly competition with our own. With this invitation they have generously responded. For so doing they have our hearty thanks. The beauty and utility of the contributions will this day be submitted to your inspection by the managers of this exhibition. We are glad to know that a view of the specimens of skill of all nations will afford to you unequalled pleasures, and yield to you a valuable practical knowledge of so many of the remarkable results of the wonderful skill existing in enlightened communities. One hundred years ago our country was new and but partly settled. Our necessities have compelled us chiefly to expend our means in felling the forests, subduing the prairies, building dwellings, factories, ships, docks, warehouses, roads, canals, machinery, etc.; most of our schools, libraries and asylums have been established within 100 years. Burdened by these great primal works of necessity which could not be delayed, we yet have done what this exhibition will show in this direction and rivaling the older and more advanced nation, in law, medicine and theology, in science, literature, philosophy and the fine arts.

Whist proud of what we have done, we regret that we have not done more. Our achievements have been great enough, however, to make it easy for our people to acknowledge superior merit wherever found.



VERTICAL SECTION OF COMSTOCK LODGE, SHOWING DISTRIBUTION OF ORE, PAY CHUTES AND BARREN PORTIONS.

the darker streaks, including the light spots, are what I regard as the pay chutes, that is, the only places where large bodies of ore will probably be found; and the black portions are the barren chutes in which there is little probability of finding ore. This theory of pay chutes, the origin of which is unknown to me, was thus referred to in an editorial published several months ago:

1. The veins of every rich auriferous or argentiferous fissure lode is partly gangue, or barren rock, partly pay ore.

2. The pay ore is not scattered about in the lode without system.

3. The use by miners of the terms "pay chutes" and "pay chimneys" is not accidental or unmeaning, but is the result of long experience.

4. The French word "chute," meaning literally a "fall" or steep channel, is the equivalent of chimney, and the two words are suggested by the fact that after the rich ore has been taken the hollow places are like the flue of a chimney.

5. A pay chute is a streak in the lode running down usually at an angle of not less than 30 deg. to the horizon.

6. There may be, and there usually is, much barren rock in a pay chute, but there is no large body of rich ore outside of it in a fissure lode.

7. A rich lode that has been well explored for more than half a mile usually shows more than one pay chute.

8. The pay chutes in the same lode dip in the same direction and at the same angle, and are approximately of equal size.

9. If the sides of the lode show streaks or scratches, as if the veins had been pushed upward between the walls, those scratches indicate the direction of the pay chutes.

10. There are pay chutes in pocket lodes as well as in milling lodes. A pocket lode is one in which the gold is found in small clusters, so rich that much of it may be separated from its quartz in a hand mortar; whereas milling lodes are those in which the metal is scattered evenly through a large mass of rock and cannot be extracted profitably without a mill.

11. Some of the "pocket miners" in the pocket mining districts, such as Bald mountain, Tuolumne county, and West Point, Calaveras county, when they find a rich pocket, near the surface, if they think it worth their trouble to sink, examine the scratches and run their incline down with them, as a guide for

Sophia and Draper, in Tuolumne; the Bovee, Woodhouse and Crispin, in Calaveras; the Hayward, Onside, Lincoln, Tellurium and Crafts, in Auer; the Pacific, in El Dorado; the Banner, in Nevada; the Sierra Buttes and Independence, in Sierra, and the Crescent in Plumas county; and of these mines one is represented to have seven pay chutes; two each six; two each five; and the 23 mines together have 54 pay chutes. Reference is not made to that report as proof, for it was based on a hasty reconnaissance, but it indicates where evidence can be obtained either to establish or overthrow our theory, and we suggest to mining engineers and superintendents, miners and mine owners, the importance of making careful vertical diagrams of their workings, showing the position of their pay ores. Such diagrams would doubtless be published without charge by the MINING AND SCIENTIFIC PRESS, and a collection of them would, we are satisfied, be of great service to educate the mining community.

As the finding of ore is the chief talk of our mining industry, I think that you will agree with me that this theory of pay chutes deserves more attention than it has yet received, and that it is very desirable to have diagrams showing the distribution of the ore in all our valuable mines. I am convinced that our miners and mining engineers have much valuable information relating to pay chutes never heretofore published. Can it not be drawn out?

JOHN S. HITTALL.

San Francisco, May 8th, 1876.

VERDICT AGAINST A MINING COMPANY.—At Carson, Nevada, this week, in the United States circuit court, a verdict was rendered for \$20,000 in the case of Mary Jane Williams, administratrix, against the Newark silver mining company, a corporation doing business in Nevada. This action was brought by Mrs. Williams to recover damages for the killing of her husband in the Newark mine, in July, 1874.

GENERAL CROOK has taken the field in person for his campaign against the Indians, Sitting Bull, Crazy Horse and the rest of the fighting Sioux. It is probable that the Reynolds band of soldiers will be sent to the rear this time, and we may expect to hear of lively times in the Indian country during the summer months.

It is reported that the Indians near Fort Pierre attacked a Black Hills train and killed and scalped a number of men. The report needs confirmation, but it is regarded as probably true.

front of the platform and was loudly cheered. The orchestra then played "Hail to the Chief," during which time the President shook hands with the Emperor and the Emperor's guests.

At 11:30, Wagner's Centennial Inauguration March was performed by the orchestra. At the conclusion of which Bishop Simpson offered a prayer, during the rendering of which a majority of the vast assemblage stood with uncovered heads.

At the conclusion of Bishop Simpson's prayer, Whittier's hymn was sung with grand effect, eliciting loud applause. It is as follows:

Hymn by John Greenleaf Whittier.

Our fathers' God, from out whose hand
The centuries fall, the grains of sand,
We meet to-day, united free,
And loyal to our land and Thee—
To thank Thee for the era done,
And trust Thee for the opening one.

Here, where of old by Thy design
The fathers spoke that word of Thine,
Whose echo is the glad refrain
Of rended bolt and falling chain,
To grace our festal time from all
The zones of earth our guests we call.

Be with us while the New World greets
The Old World, thronging all its streets;
Unveiling all the triumphs won
By art or toil beneath the sun,
And unto common good ordain
This rivalry of hand and brain.

Thou who hast here in concord furled
The war-flag of a gathered world,
Beneath our Western skies fulfill
The Orient's mission of good will,
And, freighted with love's golden fleece,
Send back the Argonauts of peace.

For Art and Labor met in truce,
For Beauty made the bride of Use,
We thank Thee, while withal we crave
The austere virtues, strong to save,
The honor, proof to place or gold,
The manhood never bought nor sold!

O make Thou us through the centuries long
In peace secure, in justice strong;
Around our gift of freedom draw
The safeguards of Thy righteous law,
And, cast in some diviner mold,
Let the new cycle shame the old.

After the singing of the opening hymn, Mr. Welch, President of the Board of Finance, presented the buildings to the United States Commission in an appropriate address. General Hewley, President of the Commission, followed in an address, and closed by presenting the exposition to the President of the United States. Then followed

The Address of President Grant:

My Countrymen: It has been thought ap-

propriate upon this Centennial occasion to bring together in Philadelphia, for popular inspection, specimens of our attainments in industry, the fine arts and literature, science and philosophy, as well as in the great business of agriculture and of commerce, that we may the more thoroughly appreciate the excellencies and deficiencies of our achievements and also give emphatic expression to the earnest desire to cultivate the friendship of our fellow members of this great family of nations. The enlightened agricultural, commercial and manufacturing people of the world have been invited to send thither corresponding specimens of their industries to exhibit on equal terms in friendly competition with our own. With this invitation they have generously responded. For so doing they have our hearty thanks. The beauty and utility of the contributions will this day be submitted to your inspection by the managers of this exhibition. We are glad to know that a view of the specimens of skill of all nations will afford to you unequalled pleasures, and yield to you a valuable practical knowledge of so many of the remarkable results of the wonderful skill existing in enlightened communities. One hundred years ago our country was new and but partly settled. Our necessities have compelled us chiefly to expend our means in felling the forests, subduing the prairies, building dwellings, factories, ships, docks, warehouses, roads, canals, machinery, etc.; most of our schools, libraries and asylums have been established within 100 years. Burdened by these great primal works of necessity which could not be delayed, we yet have done what this exhibition will show in this direction and rivaling the older and more advanced nation, in law, medicine and theology, in science, literature, philosophy and the fine arts.

Whist proud of what we have done, we regret that we have not done more. Our achievements have been great enough, however, to make it easy for our people to acknowledge superior merit wherever found.

After the address of President Grant the "Cantata" of Mr. Lanier was rendered with fine effect.

After the ceremonies in the memorial hall, the line of march was taken to the machinery building. President Grant opened the valve of the great Corliss engine and the whiz and whirl of 14 acres of machinery sounded the refrain to the cadences of the orchestra and the periods of the orator and the exposition began its course.

OF INTEREST TO CORPORATIONS.—Section 299 of the Civil Code, as introduced and amended by the last Legislature, reads as follows: "No corporation hereafter formed under the provisions of this chapter shall purchase, locate, or hold property in any county of the State, without filing a certified copy of the certificate of its articles of incorporation in the office of the County Clerk of the county in which such property is situated, within 60 days after such purchase or location is made; and every corporation now in existence must, within 90 days after the passage of this Act, file a certified copy of the certificate of its articles of incorporation, as provided in this section; and a certified copy of such copy shall, as evidence, have the same force and effect as a certified copy of the original. Any corporation failing to comply with the provisions of this section shall not maintain or defend any action or proceeding in relation to such property." This law went into effect on the 3d of April, and so far but two corporations have complied with its provisions.

ANOTHER outbreak is feared in the Massillon, Ohio, coal mines, in consequence of some of the strikers having gone to work at the offered wages. The State militia are protecting the workmen, but the strikers are awaiting their chance.

The Famous Amargoza Gold Mine.

We copy the following from the Eureka Sentinel of the 29th inst:

The story of the famous "Amargoza" gold mine, discovered about 20 years ago by a party of emigrants on their way to California by the southern route, is familiar to nearly every one on the Pacific coast. The magnificent specimens brought to San Francisco by the emigrants created great excitement at the time, but the emigrants kept the secret to themselves, and, fitting out a company, started back to their treasure trove, and that was the last heard of them until months afterwards, when it was ascertained that the party had been surprised and murdered by the Indians. Party after party has been organized, and thousands of dollars expended in searching for the "Amargoza," but all have proved unsuccessful, until a small prospecting party came upon the mine by mere chance, and no doubt under the same circumstances that led its first discoverers to its hiding place. Death valley has at last divulged its secret, and the famous Amargoza has been rediscovered. The party who found the mine was composed of J. B. Osborne, the well known mining operator of this place, and his partners, Messrs. Hassan, Phillips and Black. Mr. Osborne returned to town Thursday night, and yesterday, in a brief conversation, related to us the discovery they had made. The Amargoza is situated in a solitary mountain near the center of the southern border of Death valley, almost the last place in the world a prospector would seek for gold. It is situated in San Bernardino county, California, close to the old emigrant road. A mill had been erected on the grounds, but was destroyed by the Indians. Four adobe houses and several of stone still remain on the ground. The party made an examination of the mine, passing through the various tunnels made by the emigrants and taking out some of the rock, which proved to be red quartz, and although without the proper appliances for thoroughly testing it, they succeeded by "horning" in obtaining the most satisfactory results. A team will arrive in town in a day or two with specimens from the mine for assay. Mr. Osborne and party have located the lode and have already started work, and intend to send a sufficient number of men there to put the mine in proper working shape. Mr. Osborne has promised to give us the full details of the discovery of the mine next week. During their prospecting tour they also located a number of mines in Resting Springs district, which is also in San Bernardino county, and 25 miles from the Lincoln county line. The mines in this district show an immense body of carbonate ores and Mr. Osborne assures us that the country is the most promising he has ever seen, and the facilities for working the mines and the transportation of bullion, etc., unequalled. We anticipate a rush to that section this summer.

Banking.

The Merchants' Exchange Bank OF SAN FRANCISCO.

Capital, Five Million Dollars.

A. HAYWARD..... President.
C. W. KILLOGG..... Vice-President.
H. F. HASTINGS..... Manager.
R. N. VAN BRUNT..... Cashier.

BANKING HOUSE,
No. 423 California street San Francisco.

KOUNTZE BROTHERS, BANKERS, 12 WALL STREET, NEW YORK,

Allow interest at the rate of Four per cent. upon daily balances of Gold and Currency.
Receive consignments of Gold, Silver and Lead Bullion, and make Cash advances thereon.
Invites Correspondence from Bankers, Mining Companies, Merchants and Smelting Works.

French Savings and Loan Society,

411 Bush street, above Kearny..... SAN FRANCISCO
4v27tf G. MAHE, Director.

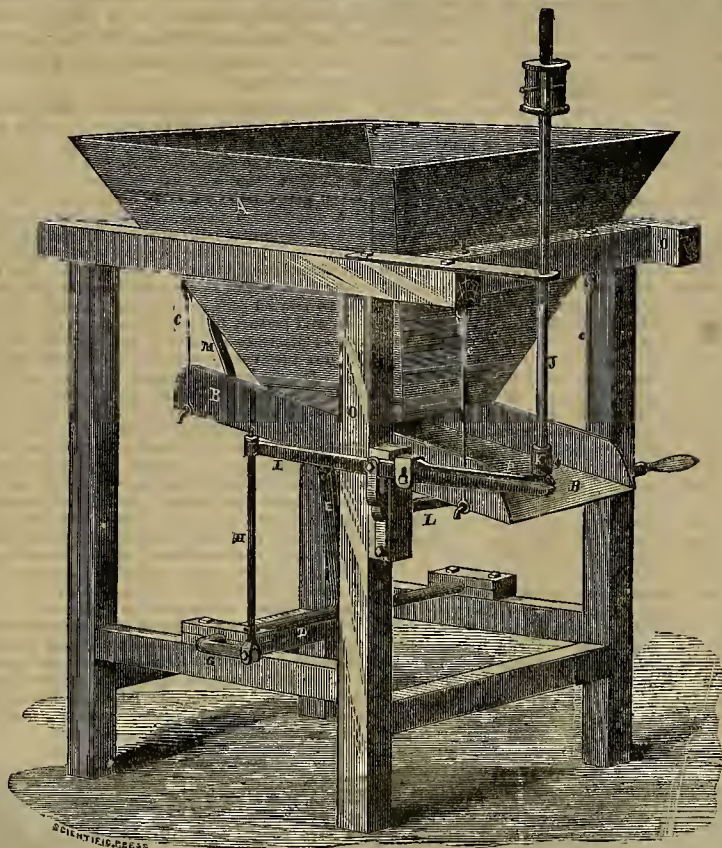
Business Directory.

J. H. PAGE, J. S. WILSON, WM. E. HALE,
Late John Taylor & Co. Mem. S. F. Board
HALE, PAGE & WILSON,
Commission Stock Brokers, 429 California Street, S. F.
Money Loaned on Leading Stocks.

GILES H. GRAY, JAMES M. HAVEN.
GRAY & HAVEN,
ATTORNEYS AND COUNSELORS AT LAW
In Building of Pacific Insurance Co., N. E. corner California and Leidesdorf streets,
SAN FRANCISCO.

WM. BARTLING, HENRY KIMBALL.
BARTLING & KIMBALL,
BOOKBINDERS,
Paper Rulers and Blank Book Manufacturers.
505 Clay street, (south west cor. Sansome),
2-3m SAN FRANCISCO

TULLOCH'S AUTOMATIC ORE FEEDER.



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417 Market Street, San Francisco.

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The Ingersoll Rock-Drill

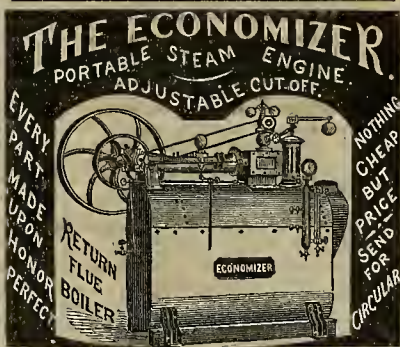


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Manufacturers of
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Machinery, Scroll-Saws,
Circular Saws, Lathes, etc.
The only Foot Power Machine without
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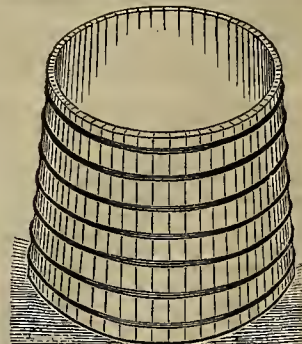
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THE MINING AND SCIENTIFIC PRESS is one the best papers published on this coast. It should be in the hands of every miner and mechanic in the State. The issue of last week contained an excellent article on the old product of this coast.—Oroville Mercury, Jan. 28.



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Steam Gauges.

The very best in the country. A large stock at reduced prices.



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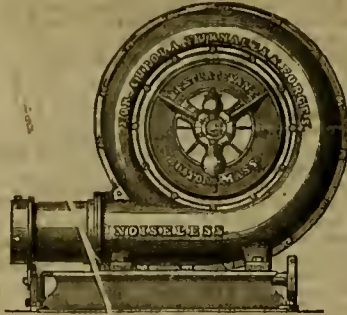
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Cost of Roasting and Chloridizing by this Process:

Two cords of wood at \$6.....	\$12.00
Two firemen at \$4.....	8.00
1500 lbs of salt at 1 1/2c.....	22.50
Wear of shoes and power.....	1.50

Cost for 15 tons.....	\$14.00
Cost for one ton.....	2.93 1/3

In a furnace of three or four times this capacity the cost is decreased by 20 per cent.

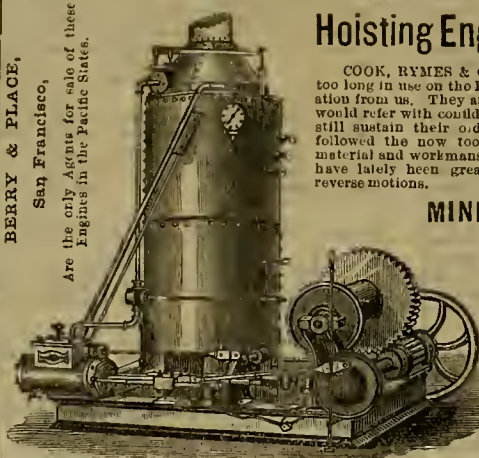
The furnace is now working successfully at the Poe Consolidated Co.'s mines, in the Peavine District. For further information, apply to

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Hoisting Engines. Mining Engines.

COOK, RYMES & CO.'S celebrated Hoisting Engines have been too long in use on the Pacific coast to require any special recommendation from us. They are well known from Alaska to Mexico. We would refer with confidence to any one of the hundreds in use. They still sustain their old reputation, the manufacturers not having followed the now too common practice of reducing the quality of material and workmanship to compete with cheaper engines. They have lately been greatly improved by adding large drums, and reverse motions.

MINING HOISTING ENGINES.

(Manufactured by the same parties.) Our new Mining Engine is built from plans and specifications of several of our most successful mining engineers, and the result is the most complete

Double Drum Hoisting Engine

Ever built. Their advantages will be seen at a glance by any one familiar with the necessities of a mine. These engines may be seen in use in Ophir, Can. Virginia, Chollar, Europa, Niagara, Leviathan, Phil Sheridan, and several other mines on the Comstock Lode. For sale only at

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(Successors to Treadwell & Co.)

NEW ASSAY OFFICE.

Thomas Price (formerly of the San Francisco Assaying and Refining Works), having fitted up the old Pacific Mail building, No. 524 Sacramento street, corner of Leidesdorff, as an Assay Office and Chemical Laboratory, is now prepared to make assays of the precious and useful metals and their ores, as well as complete or partial analyses of all minerals, salts, waters or other substances that may be desired.

His office will be opened for business on Monday, May 1st, and he hopes that his long residence and experience in his profession will entitle him to a reasonable portion of the business of his friends and the public generally.

PACIFIC MACHINERY DEPOT,

H. P. GREGORY & Co., Nos. 14 & 16 First Street,

P. O. Box 168.

San Francisco, Cal.

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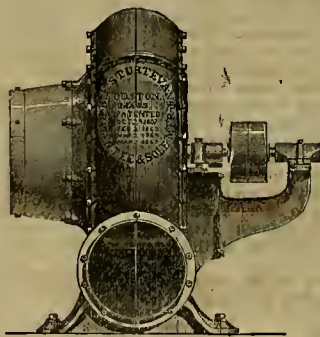
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Sturtevant Exhaust Fan for Removing Shavings and Sawdust from Machines.

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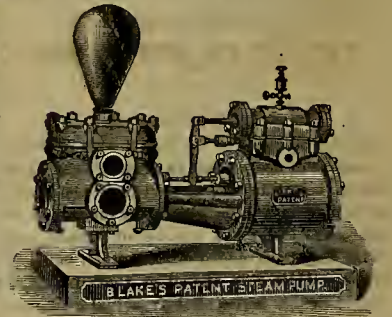
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OAKLAND, Saturday, May 13th, 1876

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H. A. OOB, AUCTIONEER, WILL SELL AT PUBLIC AUCTION,

On Saturday, May 13th, 1876, at Salesroom, 460 and 462 Eighth Street, Oakland.

42 Choice Residence Lots, THE PROPERTY OF CHRISTIAN BAGGE.

This property is situated in a portion of the city that is improving as rapidly as any part of the city; is but a short distance from schools and churches; but four blocks from the Berkeley railroad, which is now being built and will be completed within 30 days. A station is to be built at the foot of Fourteenth street, which will bring this property within 30 minutes of San Francisco. There is not to be found within the city limits more desirable residence sites than this property presents. A horse railroad will soon be built in front of this property, which will bring it within five minutes' ride of Broadway station. Terms, one-fifth cash, one-fifth in one year, one-fifth in two years, one-fifth in three years, one-fifth in four years. Interest on deferred payment at the rate of 10 per cent. per annum. For further particulars, apply to

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(Between Montgomery and Kearny.)

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Manufacturers of Files of every Description Nos. 39, 41 and 43 Richmond street, Philadelphia, Pa.

Sold by all the principal hardware stores on the Pacific Coast. LINFORTH, KELLOGG & CO., General Agents for the Pacific Coast.

Diamond Drill Co.

The undersigned, owners of LESCHOT'S PATENT for DIAMOND POINTED DRILLS, now brought to the highest state of perfection, are prepared to fill orders for the IMPROVED PROSPECTING and TUNNELING DRILLS, with or without power, at short notice, and at reduced prices. Abundant testimony furnished of the great economy and successful working of numerous machines in operation in the quartz and gravel mines on this coast. Circulars forwarded, and full information given upon application.

A. J. SEVERANCE & CO.

Office, No. 315 California street, Rooms 1 and 2.

24v26-27

PASO ROBLES, CAL., October 18th, 1875.

DEWEY & Co.—Gents: The letters patent for the Tire Upsetter have come to hand. For the prompt manner with which you have brought the matter to a successful issue, please accept my thanks.

Yours Respectfully, JOHN H. MEETZ.

LEVI STRAUSS & CO.,

Patent Riveted

Clothing,

14 & 16 Battery St.,
San Francisco.



These goods are specially adapted for the use of FARMERS, MECHANICS, MINERS, and WORKING MEN in general. They are manufactured of the Best Material, and in a Superior Manner. A trial will convince everybody of this fact.

Patented May 12, 1873.

USE NO OTHER, AND INQUIRE FOR THESE GOODS ONLY. eow-bp



SEWING MACHINES.—We have a first-class machine we wish to dispose of on favorable terms. Apply at this office.

(Continued from page 310.)

ELY DISTRICT.

HEAVY MACHINERY.—Eureka Sentinel, May 4: The Meadow Valley company at Ploche is having shipped some of the finest and heaviest machinery that has ever been used by any mining company in Eastern Nevada. The whole weighs upwards of 300,000 pounds. We noticed at the depot yesterday a shaft 15 inches in diameter and 18 feet in length, which weighed 10,000, and a portion of the engine frame, weighing 13,000. There are 60,000 pounds now at Palsade awaiting shipment.

EUREKA DISTRICT.

EUREKA CONSOLIDATED.—Eureka Sentinel, May 6: The stone work for the foundation of the new hoisting at the Lawton shaft, is completed, and the mechanics are busily engaged putting the machinery in place. It is expected that the work will be in running order by the 15th inst. It will require a few days to hoist the water out of the shaft, and active operations in the mine will commence about the 20th. The few repairs necessary on the company's railroad are being made, and everything will be in readiness for the transportation of ore by the time work is commenced in the mine. The furnaces will start up as soon as there is ore enough ahead to insure their continuous running.

The Atlas.—The fires were started in one of the furnaces at the Atlas yesterday, and the smelting of ore will commence this morning. The other furnace is undergoing repairs and will be put in operation as soon as completed. The works are under the superintendence of A. Arents, an experienced smelter, who, in the early days of Eureka, had charge of the Consolidated furnaces.

NEVADA DISTRICT.

GOON ORE.—White Pine News, May 6: A few days ago we were shown some very rich ore from the Champion mine, in Nevada district, which is situated about half way between Mineral City and Ward district. The Champion mine is owned by George W. Dale and Isaac Hand, who are now selling very grand with their prospects in opening the lead, and are well convinced that they have a bonanza. The ore we saw had been sent here to be assayed, and was said to be a fair sample of the lead, which would assay \$250 or \$300 per ton.

Idaho.

WAGONTOWN MINES.—Cor. Owyhee Avalanche, April 24: There is one notable fact pertaining to the prospects here: There is a great deal of very rich and heavy float on the surface that has come from mines not yet discovered. The coming season will reveal a great many more rich mines in this district if there is enough life left in the country to do a little prospecting. The great necessity of the camp is reduction works. We need at least two mills—one of them to work by the roasting process. We are greatly in hopes that some one will be long embrace the opportunity of making a fortune for himself while he is serving the community, by the erection of mills, to work these ores. The majority of the mines are not rich enough to warrant the owners to haul 10 miles up hill to get their ore crushed. Fine mill sites are all along Jordan creek, and the farthest mines off are not more than a mile and a half from the creek. There is some poverty in the camp in consequence of the numerous failures and great stagnation during the past winter, that but few of those who have made valuable discoveries here are able to take out a large quantity of ore until there are crushing facilities in sight. William Oglesby has sold to Doctor Peters 100 feet in the Henrietta mine for \$2,000 (\$20 per foot), one-fourth down and three-fourths on time. Note secured by mortgage for the unpaid three-fourths.

Virginia City and Comstock Mines.**NUMBER TWO.**

[By our Resident Correspondent.]

While the mines of the Comstock have been the theme of many a pen in reports, essays and letters, scientific, mechanical and historical, while they have been visited by thousands of sight-seers and some votaries of science, and while they have added millions upon millions to the world's gold and silver, there is still, a marvelous ignorance of their actual condition and a want of appreciation of and sometimes disbelief in their magnitude. That this is true of the English capitalists who are most attracted by mining investments, admits of no doubt, for while they have invested largely in other States and Territories, and even in other portions of this State, they have but little interest here. In New York the feeling of interest may be said to have only begun, and is yet almost confined to speculations in the stocks. If intelligent capital everywhere was fully informed of the developments that have been made here in the last five years, it is hardly possible that so many of the (as yet) lesser claims should make such slow progress in prospecting, in many instances having as good indications now as had some of the million producing mines a few years since. There is much need of this information in some convenient form, readily accessible to a large class of persons who would be benefited by it and whose knowledge thus gained would materially benefit the mining interests. It is of course a work of time and laborious effort, and needs as a chief requisite, the confidence and co-operation of the officers of the mining companies and the owners of undeveloped claims. With this secured, no doubt the labor would be cheerfully performed, and it is believed that a record of the results in the MINING AND SCIENTIFIC PRESS would form a valuable guide and directory to this wonderful district.

A glance at the latest map of the Comstock and its surroundings shows

A Large Number of Mining Claims

East of the north end of the ledge. And it is here, among these mines less known to the public than those which are older and more developed, that we propose to begin. Almost every inch of this ground is located, and the claims cross, interlace and overlap each other in every direction. By far the greater number have had no development, and are simply claims that have been staked off and named.

These claims are the result of the recent developments in what are known as the Bonanza mines, whose works are farther east than those of the older mines, and of a better understanding as to the dip of the vein, which in earlier

times was thought to have a westerly direction.

There are but two in this vicinity that have made any progress worthy of record. The first to be mentioned and the first that was located is the

Wells-Fargo.

This claim was staked off in January, 1873, on what is believed to be a continuation of the rich ore bodies now yielding their marvelous millions and in ground which had the orthodox surface color. The original claim was 200 feet wide and 1,500 feet long, with a northeast and southwest course, 2,700 feet east of the Utah and 3,000 feet north of the north line of the Ophir. A company was incorporated under the Nevada State law with a capital of \$3,600,000, divided into 36,000 \$100 shares, under the title of Wells-Fargo gold and silver mining company. Before much work was done an arrangement was made to consolidate this with an adjacent and parallel claim, owned by the St. Louis gold and silver mining company. This was also an incorporation under the Nevada law, with same amount of capital and same number of shares. In the consolidation it was desired to give to the Wells-Fargo stockholders twice as many shares as to the St. Louis company, therefore the number of shares was increased to 108,000, giving 72,000 shares to the stockholders of one company and 36,000 to the other, and increasing the capital stock to \$10,800,000. The new company thus formed has an area of 27 acres, and was incorporated in San Francisco in 1874, under the name of Wells-Fargo mining company. Since that time the company has been steadily prospecting, with probably more intention of economy than speed, which it seems are not usually compatible in this kind of work.

The Result of their Operations

To date is a shaft down 600 feet and a level at 500 feet, with an east and west drift. Twenty feet from the shaft in the last drift an orebody was struck of blue clay and quartz, and the drift still keeps in this low grade ore. The work of sinking shaft and running drifts continues without interruption. The hoisting works are placed near the center of the claim, and are conveniently situated for dumping and for whatever extensions future developments may require. On the grounds are carpenter and blacksmith shops and boarding houses, the whole making a fair showing for the amount of money expended, there having been but three assessments altogether, aggregating 55 cents to the share. The office in San Francisco of this company is at room 13, Sale Deposit building, and the present officers are D. L. McDonald, President; O. H. Bogart, Secretary, and O. R. Johnson, Superintendent. The latter gives his personal attention to the mine, and to his foresight is due the laying out into streets and lots of the projected town called North Virginia. Firmly believing in the future of this locality, and foreseeing the confusion and antagonism which arises from each man's putting a house wherever it suits his convenience, he wisely put in a claim for the surface ground, not to interfere with any mineral right, and had it so laid out as to make a well arranged town. About thirty houses have been built here, forming the nucleus of the future city.

The only other mining claim in this group which has had any development worthy of notice is the

Troy Consolidated,

and it is to be regretted that at this time no information can be had of its present condition, from the fact that work has been suspended, not, it is believed, from the absence of favorable indications, but from some financial difficulties. Several original claims, the True Blue, Bank of California and Sierra Nevada No. 2, and maybe one other, constitute the property of this company, making a large area. There are good and substantial buildings on the grounds, and the hoisting works are supplied with a large engine and all necessary appliances. The present depth of shaft and what other work has been done in the mine cannot be ascertained now, but a depth of 250 feet had been reached nearly a year ago, and some of the rock found suggested the belief that the north extension of the rich ledge had been found.

As soon as work is resumed more definite and detailed information will be obtained about this mine; meantime, in my next letter will endeavor to tell you something of other mines at the north end.

A Weekly List of U. S. Patents Issued to Pacific Coast Inventors.

FROM OFFICIAL REPORTS FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.]

By Special Dispatch, Dated Washington, D. C., May 9th, 1876.

FOR WEEK ENDING APRIL 25TH, 1876.*

FEVER COTS.—George W. Kilhe, Salem, Oregon.

POST OFFICE LETTER BOXES.—Elisha T. Barlow, S. F., Cal.

BOTTLE COVERS.—Earl K. Cooley, S. F., Cal.

KITCHEN TABLES.—Charles H. Townsend, Oakland, Cal.

PAVEMENTS.—John B. Wood, Santa Rosa, Cal. TRADEMARK.

LINSEED OIL.—Whittier, Fuller & Co., S. F. Cal.

Gems and Precious Stones.

[Written for the Press by HENRY G. HANKS.]

(Continued from last Week.)

Jet and Cannel Coal.

Although not strictly coming under the denomination of gems, yet as they are frequently made use of as ornaments, they naturally take their place among minerals used for ornamental purposes.

Mineral coal is a mixture of several hydrocarbons, and in its usual form is too common to require description. The two varieties

for ornamental purposes. It occurs in masses, has conchoidal fracture, is opaque, has a shining luster and is of a "jet" or pitch black color. It yields to the knife, having a hardness equal to 1.25, specific gravity equals 1.29–1.35, burns with a greenish flame, and emits in doing so a strong bituminous smell, becomes electric when rubbed and is very brittle.

Jet is sometimes called "pitch coal," or "black amber." It is found in England, Prussia, Italy, Spain, France and elsewhere.

It is much esteemed for mourning ornaments; it can be highly polished and worked into many ornamental forms. Indeed, it is astonishing to observe the results of the ingenuity of the jet workers in inventing new varieties of ornaments to tempt the purchaser.

TABLE OF CELEBRATED DIAMONDS.

NO.	NAME.	WHERE FOUND.	QUALITY.	COLOR.	WEIGHT, UNCT.	WEIGHT, CUT.	VALUE.	BY WHOM OWNED.	HOW CUT.
1	Braganza.	1741.	Brazil.	Supposed to be a white Sapphire or Topaz.	White.	1880 Carats.	Estimated \$278,400,000	King of Portugal.	Uncut.
2	Great Mogul.	1552.	Golconda, India.	Small flaws; otherwise, 1st water.	White; Limpid.	780½ Carats.	299.56 Carats.	Grand Mogul.	Rose.
3	Koh-i-noor.	known 1526.	India.	1st water.	White; Limpid.	793 Carats.	1st. 136 3d. 106.06 Carats.	Queen of England.	Oval; Brilliant.
4	Mattam.	1760.	Landak Island Borneo.	Pure; no flaws.	White.	867 Carats.	2 Gun-boats and £50,000 refused for it	Rajah of Mattam.	Uncut; Pear shape.
5	Orloff.			1st water; no flaws.	White; Limpid.	194½ Carats.	\$432,000	Russian Crown.	Oval; Rose Brilliant.
6	Regent or Pitt.	First known, 1717.	Malacca.	1st water; no faults.	White; Limpid.	410 Carats.	163½ Carats.	Crown of France.	Brilliant; Cutting cost \$35,000.
7	Star of the South.	July, 1859.	Bahia, Brazil.	1st water; defective in shape.	Perfectly White; Limpid.	254½ Carats.	124 4-16 Carats.	M. E. Costar, Amsterdam.	Oval; Form Brilliant.
8	Shah.			Perfectly pure & free from defects.	White.	86 Carats.		Russian Crown.	Irregular prism; engraved with Persian inscription.
9	Piggot.			Not Fine.	White.	82½ Carats.	82½ Carats.	Not Known.	
10	Nassak.				White.	89½ Carats.	78½ Carats.	Marg's of Westm'str	Triangular form.
11	Nizam.			1st water.	White.	340 Carats.		King of Golconda.	Uncut.
12	Sancy.	In 1479, bought by the King of Portugal.			White.	53½ Carats.	53½ Carats.	Crown of France; lost in the revolution and never found.	Almond shape; double rose.
13	Blue Diamond.				Sky-blue.	67½ Carats.		Crown of Russia.	
14	Polar Star.					40 Carats.		Bussian Crown.	Brilliant.
15	Hope.			1st water.	Sapphire Blue.	44½ Carats.	44½ Carats.		Oval; well cut; good proportions.
16	Holland Diamond.					33 Carats.	33 Carats.		
17	Green Diamond.				Emerald Green.	48½ Carats.	48½ Carats.	Dresden Treasury.	Irregular; Brilliant.
18	Black Diamond.				Black.		\$48,000		
19	Cumberland.					32 Carats.	\$10,000	Queen of England.	
20	Eugenie.			Perfect.		51 Carats.		Emperor Napoleon.	Oval; Brilliant cut beautifully.
21	Florentine.				Light Yellow.	139½ Carats.		Emperor of Austria.	Rather thick Rose.
22	Pachaoi Egypt.			Good quality.		40 Carats.		Ibrahim Pasha.	Octagonal; Brilliant.

named above are not so common as others, and to them only I call attention.

Cannel coal is a variety of bituminous coal found sparingly in various parts of the world. Like other coal, and like the diamond, it is of vegetable origin, and has undergone many changes during process of formation. It is compact, has little luster, breaks with a conchoidal fracture and shining smooth surface. It affords on distillation a large proportion of hydro-carbon oil. The celebrated "Parrot cannel coal" found near Edinburgh, Scotland, is so called because when heated it decrepitates with a sound thought to resemble the voice of a parrot.

Another cannel coal, also from Scotland, is called "Torbernite" or Boghead coal. Cannel coal can be turned in a lathe and fashioned into ornaments of considerable beauty.

Jet is a variety of cannel coal much valued

for ornamental purposes. It occurs in masses, has conchoidal fracture, is opaque, has a shining luster and is of a "jet" or pitch black color.

The "True Whitby jet," so extensively advertised, comes from Whitby, in Yorkshire, England. It is found in fragments of medium size, in clay. Glass, vulcanite and enamel are sometimes substituted for it.

Jet was well known to the ancients under the name of Gagates, so called from its having been found at Gages, in Syria.

Pliny, as usual, ascribes medicinal and other virtues to it, such as the following, which I quote:

"The fumes of it when burned keep serpents at a distance, and dispel hysterical affections;" "A decoction in wine cures toothache," etc.

Large quantities of manufactured jet find a ready market in Spain and Turkey.

The sum of £20,000 is stated to be the annual value of the Whitby manufacture.

General News Items.

The iron door of the Bergen tunnel magazine, at Jersey City, was found two miles distant after the explosion.

The New York Herald prints a letter from Midland, Georgian bay, Canada, certifying that Boss Tweed and two companions spent the Winter on Muskota river, 30 miles from Midland and 100 miles from Toronto.

In the case of the monte sharp against the Union Pacific railroad, for damages for having been put off the train, in the Court at Omaha, the jury gave a verdict of \$1.74. The judge said the company had a right to eject gamblers.

The State militia are in requisition in Massillon, Ohio, to prevent the outbreak of the coal mining strikers.

PESACH N. RUBENSTEIN, the condemned murderer of the Jewess, Sarah Alexander, died at Raymond street jail. Cause, general debility.

A WASHINGTON dispatch, speaking of the Belknap case, says: A decision will not, it is thought, be reached for two weeks to come; but the impression prevails to-night that the Senate will decide in favor of jurisdiction.

NEARLY \$200,000 worth of silver was paid out Monday at the New York Sub-Treasury in redemption of currency. Owing to the heavy demand further silver payments have been suspended to await advices from Washington.

METALS.

[WHOLESALE.]

WEDNESDAY M., May 3, 1876.

American Pig Iron, #1 ton	38 00	36 00
Scotch Pig Iron, #1 ton	35 00	37 00
White Pig, #1 ton	35 00	37 00
Oregon Pig, #1 ton	35 00	37 00
Refined Bar, good assortment, #1 lb.	4 00	4 00
Refined Bar, good assortment, #2 lb.	4 00	4 00
Boiler, No. 1 to 4	5 00	5 00
Plate, No. 5 to 8	5 00	5 00
Sheet, No. 10 to 12	5 00	5 00
Sheet, No. 14 to 16	5 00	5 00
Sheet, No. 18 to 20	5 00	5 00
Sheet, No. 22 to 24	5 00	5 00
Sheet, No. 26 to 28	5 00	5 00
Some Shims, per lb.	10 00	8 00
Nail Rod	10 00	8 00
Norway Iron	9 00	8 00
Roller Iron	8 00	8 00
Other Irons for Blacksmiths, Miners, etc.	8 00	4 00
COPPER.—		
Brass	35 00	40 00
Copper Tin	35 00	40 00
O'Neil's Pat.	25 00	40 00
Sheeting, #1	25 00	40 00
Sheeting, Yellow	25 00	40 00
Sheeting, Old Yellow	25 00	40 00
Composition Nails	25 00	40 00
Composition Bolts	25 00	40 00
Brake—English Cast, #1 lb.	25 00	40 00
Anderson & Woods' American Cast	25 00	40 00
Drill	25 00	40 00
Flat Bar	25 00	40 00
Flow Steel	25 00	40 00
TIN PLATES.—		
10x14 1/2 Charcoal	10 50	11 00
10x14 1/2 X Charcoal	12 50	13 00
Roofing, Plate 10 Charcoal	10 00	10 50
Ranches Tin	26 00	26 00
Anstralian	18 00	20 00
Zinc, By the Cask	11 00	11 00
Zinc, Sheet 23 1/2, No 7 to 10	11 00	11 00
do 23 1/2, No 11 to 14	11 00	11 00
do 23 1/2, No 15 to 18	11 00	11 00
do 23 1/2, No 19 to 22	11 00	11 00
do 23 1/2, No 23 to 26	11 00	11 00
do 23 1/2, No 27 to 30	11 00	11 00
QUICKSILVER, per lb.	3 00	3 75
QUICKSILVER, per lb.	72 00	75 00

Gold, Legal Tenders, Exchange, Etc.

[Corrected Weekly by CHARLES SUTRO & Co.]
 SAN FRANCISCO, May 3, 3 P. M.
 LEGAL TENDERS in S. F., 11 A. M., 50 to 50 1/2. Silver, 3 per cent. discount.
 Gold in N. Y., 113.
 GOLD BARS, 900 to 1000. SILVER BARS, 12 and 20 per cent. discount.
 EXCHANGE on N. Y., 50-100 per cent. premium for gold; on London bankers, 4 1/2 Commercial, 4 1/4; Paris, 5 1/2 francs per dollar; Mexican dollars, 8 per cent. discount.
 LONDON — Consols, 93 to 93 1/4; Bonds, 102 1/4.
 QUICKSILVER in S. F., by the flask, per lb., 72 1/2 to 75.

DEWEY & CO.,

United States and Foreign

Patent Agents,

No. 224 Sansome St.

SAN FRANCISCO.

Patents Obtained Promptly.
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 Examinations Ordered and Reported by TELEGRAPH.
 Examinations made of Assignments Recorded in Washington.
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 Every legitimate branch of the Patent Agency Business promptly and thoroughly conducted.
 Send for Circular

WOODWARD'S GARDENS embraces an Aquarium, Museum, Art Gallery, Conservatories, Tropical Houses, Menagerie, Seal Ponds and Skating Rink.

Mining and Other Companies.

Persons interested in incorporated shares will do well to recommend the publication of the official notices of their companies in this paper, as the cheapest appropriate medium for the same.

Mariposa Land and Mining Company

of California. Location of principal place of business, San Francisco, Cal. Location of works, Mariposa County, Cal.
 Notice is hereby given, that at a meeting of the Board of Directors, held on the second day of May, 1876, an assessment (No. 3) of one dollar per share was levied upon the capital stock of the corporation, payable immediately in United States currency, to the Secretary, at the office of the company, No. 309 Montgomery street, room 33, Nevada Block, San Francisco, Cal., or to the Assistant Secretary, at the office, No. 3 Nassau street, New York.

Any stock upon which this assessment shall remain unpaid on the third day of June, 1876, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Friday, the 30th day of June, 1876, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors, L. E. N. DEXTER, Secretary.

Office, Room 33 Nevada Block, No. 309 Montgomery street, San Francisco, Cal.

Amador Canal and Mining Company.

Location of principal place of business, San Francisco, Cal. Location of works, Jackson County, Cal.
 Notice is hereby given, that at a meeting of the Board of Directors, held on the ninth day of May, A. D., 1876, an assessment, No. 1, of three dollars (\$3.00) per share was levied upon the capital stock of the corporation, payable immediately, in U. S. gold coin, to the Secretary, at the office of the company, room No. 2, 418 California street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 15th day of June, 1876, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Wednesday, the 15th day of July, 1876, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors, J. W. OLARK, Secretary.

Office, Room No. 2, 418 California street, San Francisco, Cal.

Schofield's
SULPHURET CONCENTRATOR.THE BEST MACHINE IN USE FOR
SAVING SULPHURETS.No Power Required to Run it, and only a Small Stream of
Water under a Light Pressure.ECONOMICAL,
EFFECTIVE,
DURABLE,
AND SURE IN OPERATION.The especial attention of parties erecting new mills is called to this
Valuable Improvement.

WE GUARANTEE THAT THIS MACHINE WILL SAVE NINETY PER CENT. OF ALL THE SULPHURETS
IN THE ROCK AT A MERELY NOMINAL EXPENSE. IT HAS NOW STOOD THE SEVERE
PRACTICAL TESTS OF OVER A YEAR'S WORK AT DIFFERENT MILLS
ON THIS COAST, AND HAS BEEN EMINENTLY
SUCCESSFUL IN EVERY CASE.

The following letters, from practical men who have used this machine, will show to
those interested what it has accomplished:

BANDERETA MINE,

Mariposa County, Feb. 7th, 1876.

CHAS. SCHOFIELD, Esq.—Dear Sir: We have been using your Concentrator at our mill about six months, and find that it saves over 90 per cent. of the sulphurets contained in the ore, and all of the amalgam and quicksilver which escapes from the battery. The machine is simple in construction, perfect in operation, and requiring no power to run it, is very economical. I can confidently recommend it to all mill men as the best and cheapest Ore Concentrator now in use.
 Yours respectfully,
 LEVI NOEYS, Superintendent.

NONPAREIL GOLD MINING CO.'S WORKS,

Deer Flat, Tuolumne County, Cal., April 12th, 1876.

MR. CHARLES SCHOFIELD—Dear Sir: It is four months since the Sulphuret Concentrator you furnished our company's mill with was first put in operation, and during the past three months has been nearly in constant use. The men attending the Concentrator having acquired by practice a thorough knowledge of its workings, there is nothing more to be desired; it is perfect. A number of mill men have examined the Concentrator and its workings, and pronounce it the most simple in its construction, perfect in its work, and cheaply run of any they had seen. If you think by showing this it will assist you in disposing of your Sulphuret Concentrators, you are at liberty so to do, as it will afford me much pleasure in having contributed my little mite towards rewarding true merit. Hoping you will meet with complete success,
 I remain yours truly,
 JOS. J. DUPRAT, Superintendent.

CON. ALABAMA M. CO.,

Tuolumne County, May 1st, 1876.

C. SCHOFIELD, Esq.—Dear Sir: The Concentrating Machine recently purchased of you is now in active operation, and we are highly pleased with it. It saves over 90 per cent. of our sulphurets, and is run with very little expense. We could not afford to be without it, and can safely recommend it to all mill men as the best and most economical machine in use.
 M. S. McCONNELL, Superintendent.

WASHINGTON MINE,

Mariposa County, Cal.

CHAS. SCHOFIELD, Esq.—Dear Sir: Having had one of your Double Rigged Concentrators in use now at this Mill for over a year, I take this opportunity of informing you that it is far superior to the old English Biddle we have been using for the last four years, not only in a saving of labor, but having a less waste of sulphurets in washing.

We have the machine connected with the tail sluice, and receives the sand and water direct from the batteries, without any handling, and it does the concentration for the 20 stamps easy, with a loss of less than 10 per cent.

Two Chinamen do all the work required—one night and the other day—working 12 hours each, and get out about a ton each day, thus concentrating 30 tons into one, at a cost of less than four dollars. As the cheapest, most economical and best working Concentrator I know of I can recommend it to others without any hesitation.

Yours truly,

GEO. E. WEBBER, Jr.,

Superintendent Washington Mining Company.

MR. SCHOFIELD—Dear Sir: Having carefully examined your Concentrator, which I have seen in successful operation at the Francis Company's Mill and also at the Benton Mills, on the Mariposa Estate, I have no hesitation in saying that it is the most valuable Concentrator I have met with during my long experience as amalgamator in this country. Its manner of catching quicksilver and amalgam is thorough and complete, and it saves the sulphurets clean and with a loss of less than ten per cent.

Yours respectfully,

L. BURDOW.

MR. C. SCHOFIELD—Sir: I have worked one of your Sulphuret Machines at the Benton Mills about 30 days, and am satisfied it is the best machine for saving amalgam and sulphurets ever used on the Mariposa Estate.

L. GILMAN.

The following testimonial is from the well known mining expert, PROF. J. E. CLAYTON:

CHAS. SCHOFIELD, Esq.—Dear Sir: Having followed the business of mining engineering for upwards of 30 years, and having had in this connection much to do with regulating machinery for saving gold and concentrating sulphurets, and having in nearly every mining camp on the Pacific Coast examined the various kinds of Ore Concentrators in use, I will say that I have nowhere seen anything half as cheap and simple in its construction, scientific in principle or effective in operation as your machine.

J. E. CLAYTON.

Machines can be Furnished at Short Notice. In all Cases we Furnish the
Concentrator Complete, Set it Up, and Instruct the Buyers as to
the Proper Way of Managing It.

ADDRESS:

SCHOFIELD CONCENTRATING COMPANY,

ROOM 59, NEVADA BLOCK, SAN FRANCISCO.

W. T. GARRATT'S

BRASS and BELL FOUNDRY
SAN FRANCISCO.

MANUFACTURER AND IMPORTER OF
Church and Steamboat BELLS and GONGS,
BRASS CASTINGS of all kinds,
WATER GATES, GAS GATES,
FIRE HYDRANTS,
DOCK HYDRANTS,
GARDEN HYDRANTS.

A General Assortment of Engineers' Finding.
Hooker's Patent
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Steam Pumps and Fuel.

A correspondent of the Gold Hill News says: The tests made by the Mechanics' Institute of San Francisco are most valuable to miners who are compelled to use the ordinary steam pump for raising water, as it proves that however convenient they are for temporary purposes, they never ought to be used as a permanent engine to drain mines. Hitherto it has been well known that they were expensive, but the cause was allowed to be entirely in the length of steam pipe and the condensation therefrom. But these tests have shown this to be erroneous, and that the fault lies in the manner of working the steam non-expensively, and in the arrangement of the steam valves, and at high motions in the pump valves.

Taking the report of the committee on the best pump, we find that the amount of steam displaced by the piston, or the effective steam, was only 42 per cent. of the total amount of steam passed through the cylinder, and the "duty" of the pump was 17 pounds of coal per horse power per hour.

When this is compared with the duty of first-class compound engines, whose duty has been as low as one and one-half pounds of coal per horse power per hour, and that a good fair figure for compound pumping engines is two and one-half pounds, it will be seen that these pumps ought never to be used as a permanent pump. As these tests were made with a short steam pipe, it is evident that the great waste is not due to the long pipe in mines, and experiments have demonstrated that the condensation which takes place in pipes of a thousand feet in length does not exceed a half pound of coal per horse power per hour when connected with first-class compound engines, and that in the ordinary steam pump it is the cause of but a small percentage of the loss.

In many of the mines these common steam pumps are used with compressed air instead of steam, and what the loss is on them, even where no condensation can occur, ought to be demonstrated by careful experiment; but approximate results show that it must be very great. Unfortunately no record is kept, and generally the different engines are all connected with the one set of boilers, and no separate account can be made. Who amongst our mining engineers will, for the information of the public, give the true data on the above subject?

ONE estimation is that the Big Horn district, as well as the Black hills, will be deserted in a month. Another estimate is that over 5,000 miners will be in the Big Horn district, Montana, by the middle of May. Readers can take their choice.

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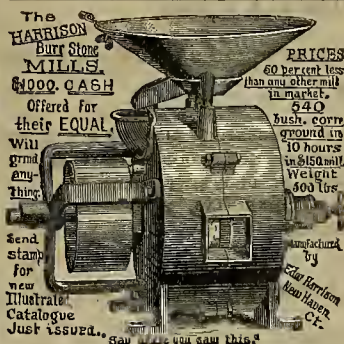
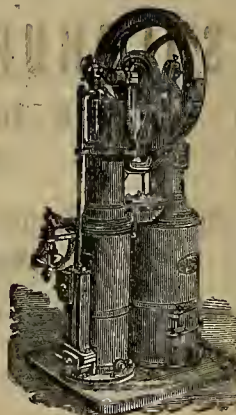
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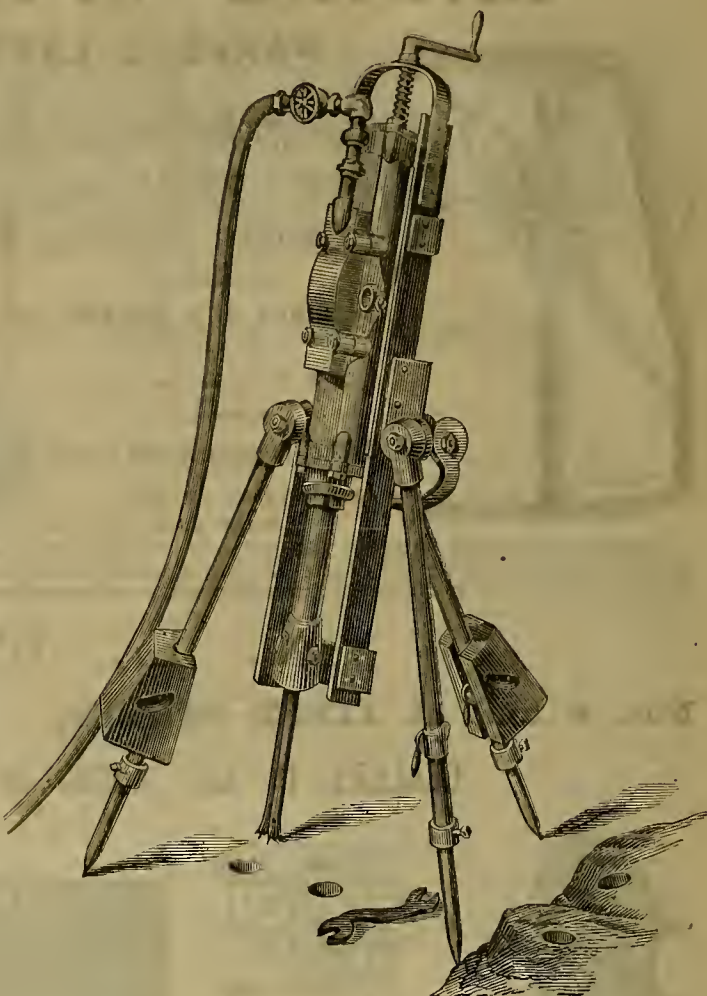
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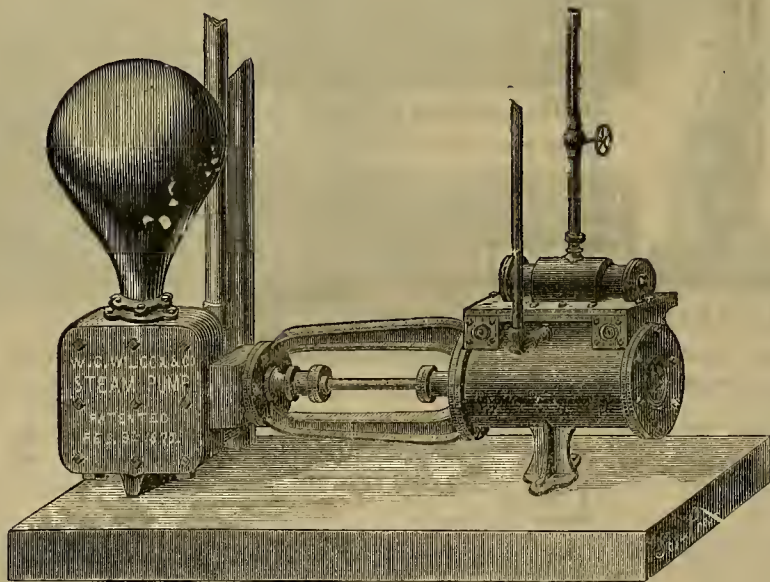
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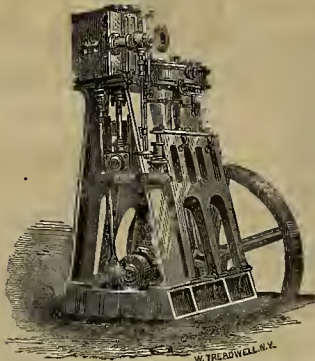
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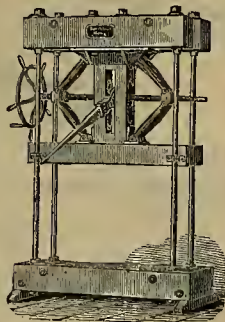
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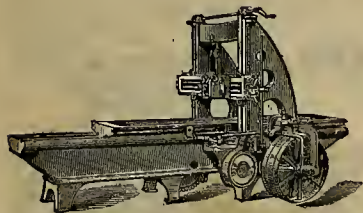
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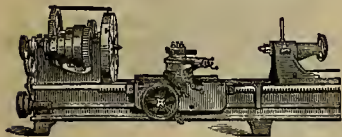
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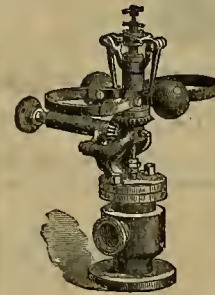


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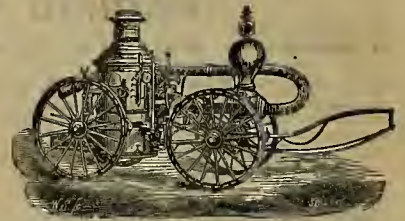


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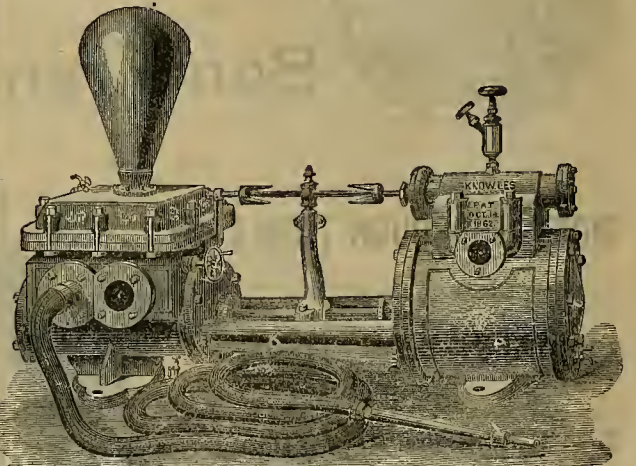
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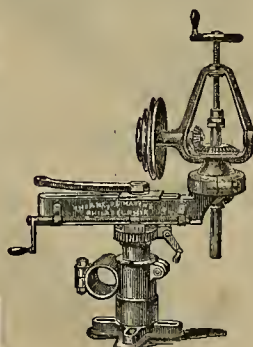
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MINING AND SCIENTIFIC PRESS.

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BY DEWEY & CO.,
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SAN FRANCISCO, SATURDAY, MAY 20, 1876.

VOLUME XXXII
Number 21.

Automatic Boiler Feeder and Regulator.

We illustrate on this page Cook's patent automatic boiler feeder and regulator, which has attained a high reputation in the Eastern States, and is now for the first time introduced on this coast. Its economy of operation, together with the protection it affords, renders it an object of great interest to all users of steam boilers.

Figure 1 represents the feeder in operation; Figure 2 represents it with the man-head out, showing its construction and parts as follows: The body of the feeder is a boiler-iron cylinder, 20 to 30 inches in diameter, and from 30 to 60 inches long, as may be desired, having a cast iron head with a man-hole in the front head. B is a valve or three-way cock, to let on and exhaust the steam from the cylinder. A, F is a float shaft and lever to turn the wheel, C. The float, J, is a hollow cast iron cylinder (shown in Fig. 2), and attached to the float shaft by arms at each end. L is a man-head with counterbalanced wheel attached. The operation is as follows: As shown in Fig. 1, the feeder is empty and the steam exhausted from the shell, A. The water will flow from the supply tank through the pipe, G, by its own gravity, and fill the feeder; as it fills, the float, J, rises, and the lever, F, turns the wheel, C, and this lets the steam pass through valve, B, on top of the water. The pressure between boiler and feeder is now equalized, and the water will flow through the pipe, O, to the boiler until the feeder is empty, or the water line in the boiler raised up to the end of the pipe at H, when the water will close the end of the steam-pipe, H, and stop any further supply until needed.

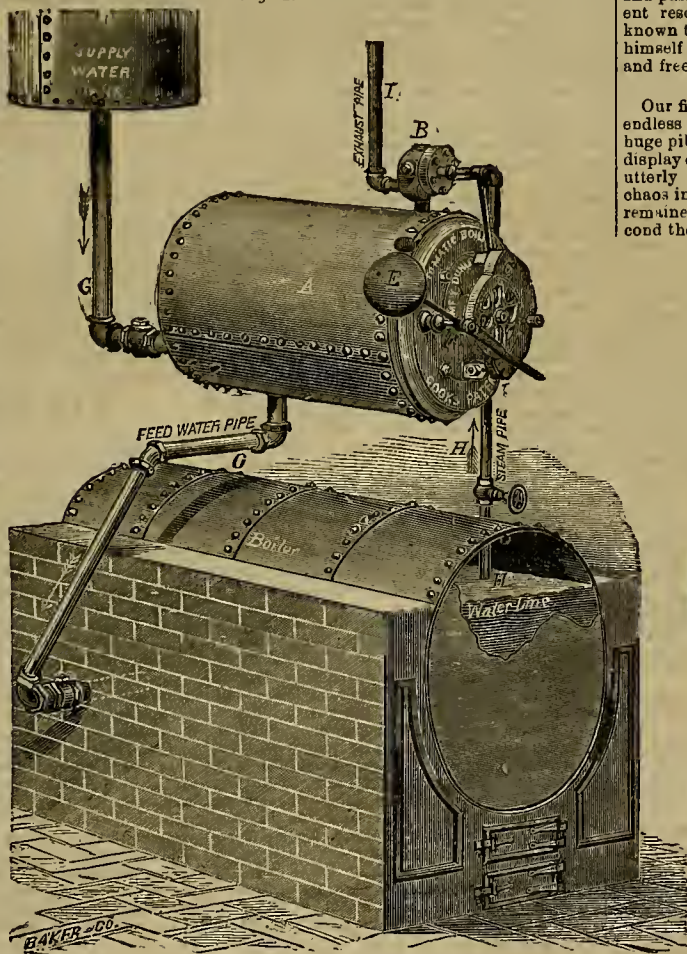
When the feeder is empty the float, J, has descended to the bottom of the feeder, and in so doing has cut off steam by means of a valve, B, and opens the steam exhaust port. It will again fill, and will continue thus operating as fast as the boiler receives water, keeping the water line at one limit all the time.

When it is necessary to take water from below the boiler, the feeder forces it up, using an iron tank for the purpose and one more pipe than shown in the engraving. It is impossible for the feeder to fail to put the water into the boiler if it moves at all. It is simpler than any pump and more durable, as it will discharge from 40 to 200 gallons at one movement, where a pump would require hundreds of strokes to do the same work. Moreover it is automatic and requires no judgment as to speed, like a pump. It works equally well under 200 pounds pressure, or using hot or cold water. It has great economy of fuel to recommend it, as it supplies water in exact proportion to that evaporated, and maintains an exact water line at all times, saving a large proportion of fuel.

The machine does not require to be started or

stopped, as in all its functions it is entirely automatic. Cook's automatic boiler feeders were awarded the highest premium over all machines exhibited as boiler feeders at the Cincinnati exposition and St. Louis fair, in 1875. Goddard & Co., Pacific iron works, in this city, agents for the Pacific coast, exhibit numerous testimonials as to the efficiency, economy and safety of this invention, and expect to introduce it extensively here. This feeder is also made with a heater and regulator combined. The heater is an excellent one, putting the water into the boiler at near the boiling point, and the feeder maintaining a uniform water line.

Fig. 1.



COOK'S PATENT AUTOMATIC BOILER FEEDER AND REGULATOR.

These inventions insure safety in preventing boiler explosions and in economy of fuel. One of the feeders may be seen in operation at the Pacific iron works, First and Fremont streets.

The *Amador Ledger* says: "Some of the magnates of the Central Pacific railroad made a visit to Ione during the week, on business pertaining to the early completion of the branch road to Ione. The citizens have fixed upon the 4th of July as the time for opening the road, and intend to signalize the event by the grandest celebration ever had in the valley."

COPPER IN WASHINGTON TERRITORY.—The copper mine recently discovered on Gumes Island, near San Juan, Washington Territory, promises to prove valuable, although very little work has been done as yet. At twenty feet from the surface ore which assays 25 per cent. of copper has been struck.

In the trial of the Mary Ann company vs. The Pacific Consolidated mining company, for 600 feet of mineral ground in Cherry Creek district, the jury disagreed and were discharged, after a deliberation of twenty hours.

The Centennial at Philadelphia.

[Editorial Correspondence.]

PHILADELPHIA, May 9th, 1876.—Your correspondent arrived here yesterday morning and, though much fatigued and covered with the dust of 3,000 miles of travel, made a hasty toilet and proceeded at once to headquarters on Walnut street, to secure the permit necessary to enter the grounds—a permit to enter the buildings being peremptorily refused to all except those actually engaged in preparing their exhibits. Having reached the grounds, however, and passed the outer sentinel, your correspondent resorted to one of the many ways so well known to newspaper reporters, and soon found himself inside of the great exhibition building, and free to move as inclination dictated.

Bustle of Preparation.

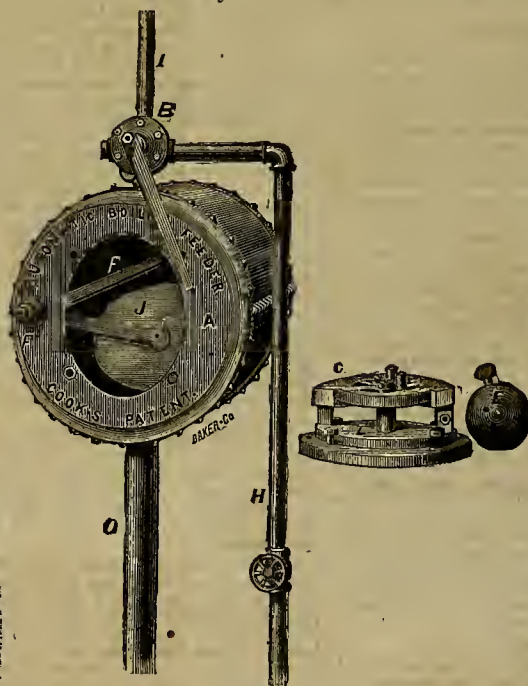
Our first thought on looking upon the almost endless confusion of full and empty boxes, the huge piles of dirt and refuse and the imperfect display of exhibits generally, was that it would be utterly impossible to bring order out of such chaos in the brief time of a day and a half that remained for such preparation. But on a second thought, after viewing the great army of

however, that these were the last trains that would be allowed to enter the enclosure, and was furthermore assured that all the confusion I saw around would be transferred into admirable order by to-morrow's morn.

A Terminal Agency

Is now actively engaged in the general superintendence of these final preparations, compelling exhibitors to hurry up their work, remove their rubbish and get ready for the grand opening to-morrow. Some idea may be formed of what has been done from the fact that about 3,000 car loads of goods have been received—100 a day for the last three months. This is all in addition to the local exhibitors, who are numerous, and who have taken their goods to the buildings in drays and express wagons. No less than 847 wagon loads were so received in one day—Saturday last—and this morning it is stated that fully as many loads entered the grounds yesterday. A comparison of these means of transport and the foregoing data will enable a San Franciscan to institute some comparison between what is promised by a world's exhibition in Philadelphia and a Pacific coast exhibition in the Golden City. This morning all the gates were closed to cars and wagons, and only small packages and lots will hereafter be received, under special permits.

Fig. II.



The Centennial Commission met at the judges' pavilion, on the grounds, yesterday afternoon, to attend to some of its final preparatory duties. At this meeting Judge Creigh, of San Francisco, and the Commissioner for California, was called to the chair. The Committee met again at 10 o'clock this morning, for final action.

Preparations for the Opening.

All Philadelphia seems to be preparing for the grand event of to-morrow. The mayor is out with a proclamation this morning requesting the closing of places of business on the occasion, and a general illumination in the evening. It is said that the decorations and show of bunting, both public and private, will be on a grand scale. The Centennial bell will be rung for half an hour at sunrise, noon and sunset. The church bells will

also be rung at the same times. A grand platform is in progress of erection against the wall of memorial building, and a corresponding one on the opposite side of the space, against the wall of the main exhibition building. Seats are being put up sufficient for the accommodation of at least 5,000 persons—the most or all of whom are especially invited to the platform. A wise determination seems to have been arrived at to make the opening ceremonies simple and brief. Only "words few and fitting" will be spoken. But readers of the Press will have been already fully informed of these opening exercises by telegraphic report before my writing can reach them by mail.

The Buildings, Grounds, Etc.

Of course, during the limited time allowed me for examination yesterday, I could learn but little of the progress which has been made in putting up and fitting up the various annexes of the different States and nations. I shall examine all and them at my earliest leisure.

The Bank of Nevada county, which suspended a month ago, will re-open, it is stated, on June 16th.

CORRESPONDENCE.

Botanical Excursions.

[By J. G. LEMMON.]

No. 2. The Northern Valleys and Lassen's Peak. (Continued.) Part III. Indian Valley and its People.

Exploring the broad breast of Prince Sierra thus far, reveling among his elaborate decorations, we have found much to admire, much to excite curiosity, and much to show his high standing in society. We have discovered, if hedges are a sure indication, that he inherits the crescent of the Oriental caliphs, has joined the Odd Fellows, become a Royal Arch Mason, and been honored with the microcosm—the insignia of a master of natural history and philosophy. We shall find further that he has been knighted with the beautiful Maltese cross, wears the glittering shield of a union defender, has mounted the stars of a commander-in-chief, and sways the scepter of a king.

Indian Valley.

Entering Indian valley from Butterfly valley by way of the Quincy toll road, we emerge first upon the south arm of the Maltese cross, and a most entrancing scene lies before us. Nestled down, in and out among the warm beses of the mountains, lies the jewel, its center embossed by several sugar-loaf islands, its arms extended and passing out of sight among the crowding, brown, oak-bordered mountains. Fences and farmhouses everywhere checkmark and punctuate the plain, but, as in Sierra valley, its villages are hid away in the far corners. Several days of delightful travel will reveal wonderfully beautiful nooks and dells sequestered along the border, while its arms are deltas of alluvial riches to the practical eye, and alcoves of picturesque scenery to the naturalist.

Yes, Indian valley has fields, gardens and meadows—none richer in the State; it has roads, bridges, fences and barns; it has school-houses, churches and society halls; it has quartz and flouring mills, lumber and furniture factories; it has mining camps and thriving villages; it has shops and stores—aye, and it has gambling dens and whiskey holes, too; but I see not these now, I recall not these elements of prosperity, I only see its comfortable homes and think of the warm-hearted people residing in them.

A Social People.

I think of the long years of frequent visits to that sweet vale, and the kind attentions ever tendered me by its citizens. Every house was my home, every person my friend. Never was a people better characterized for hospitality.

Then there are active minds there, those that hunger and thirst for knowledge. There are hearts that throb responsive to throbbing hearts, souls that are knit unto souls. I cannot discriminate where all are so kind, but some insist upon their friendship in a way that is irresistible. They seize you by the hand and drag you into the house, while confederates steal your horses, hide the harness and lock your wagon in the barn; then all gather round you with speaking faces. They look you in the eye and question you closely. Eyes dance and voices ring with joy if you are merry, they fill with tears and tremble with sorrow if you have woes to relate.

From this description the reader will naturally infer that the people of Indian valley are fond of social visits, dances and open-air festivals. You can scarcely enter the valley any day in summer without seeing a company of citizens, old and young, gathered in a grove enjoying a picnic. A Grange recently organized there also furnishes entertainment of a high character. In the winter not a day of any note in the calendar is allowed to pass uncelebrated by a dance or festival—beside, there is a regular social club that gives entertainments at frequent stated intervals.

The Picnic.

It was into this community that Larsen and I entered one golden day last summer. It happened to be the 24th of June, St. John's day. I assured my comrade that the day would be celebrated, of course, and 12 miles away, in Genesee valley, we heard of a Mesonic picnic at Taylorsville and drove straight for it. There were half the residents of the valley assembled under some noble pines—tables, seats, speaker's stand, orchestra, canopy, and a merry-go-round for the children propelled by a horse—nothing lacking for a good old-fashioned picnic.

I had been among these people years before, teaching misal geography, riding the circuit of their districts weekly for a winter, and had often visited them in summer botanizing, but their early enthusiastic friendship was scarce abated. What a hand-shaking and greeting! Solicitations poured in on all sides to go home with this family and that. Dr. Hunt and his wife, being large persons, and friendly in proportion, proved well nigh successful, but Mr. Ames, about a match for the doctor, and his wife, being the botanist of the valley, they overcame all, and promising the doctor and his family an early call, as they termed it, of a day and two nights, we drove straight for the pleasant home of Mr. Ames, away up in the north arm among the low, thick-leaved oaks.

The Botanical Feast.

A royal feast followed! All Mrs. Ames' col-

lection of the season was displayed, also packages received from foreign parts in exchange for Sierra plants. To this display was added her extensive botanical correspondence—letters of inquiry; of congratulation from Drs. Gray, Canby and Thurber; from Profs. Watson, Woolson and Congdon, and from many other scientists of less note—all drawn to her by the exceeding merit of her labors, the readiness of her assistance and the beauty of her letters. The proceedings of the American academy of sciences at the East make such frequent mention of this California botanist and collector, that perhaps the *RURAL* readers would like a pen-picture.

Mrs. M. E. P. Ames, the Botanist.

Mary E. Pulsifer is the eldest of two sisters, only children of John W. and Silena Pulsifer. She was born in the city of Lowell, Massachusetts, about 35 years ago. (I am not positive as to dates and am writing this sketch without the slightest intention or expectation of doing so until this moment.)

Early in the great California exodus, I think in '49, Mr. Pulsifer came to this country, hastened into the mountains and soon penetrated this secluded valley in search of gold. He prospected carefully the quartz ledges in the enclosing mountains and discovered a rich one, where afterward sprung up the village of Crescent. He developed the mine, sold out, acquired several thousands, and returned East for his family, then, I believe, in Iowa.

Taking them again to Lowell and putting the daughters in school, he resided there some years, then with his family emigrated to California, to make it their home.

Locating in the semi-tropical Santa Clara valley, the youngest daughter, Martha, found food for her intellectual and literary tastes, while Mary, intensely fond of flowers from infancy, was in Paradise. The careful parents placed their promising daughters in the Santa Clara college to finish their education, and opened their house for the reception of the best society of the valley. Here Mr. Pulsifer gave loose rein to those social, intellectual and philosophical desires that through life had struggled for exercise, and he became noted for intelligence, research, social magnetism and generous assistance.

The old mining fever working still in his veins, impelled him to remove for a few years to Shaw's flat, in the southern mines. Here the diligent young botanist added to her specimens the peculiar flora of Table mountain. Here was a stepping stone to the high Sierra, a foretaste of its alpine flora. The next remove was to the early home of the bold prospector, over the Sierra, the flower-gemmed Indian valley.

Purchasing a ranch in the north arm, and surrounding his family with home comforts, Mr. Pulsifer continued those mental recreations and philosophical researches which drew around him a large circle of friends. Among them appeared Mr. C. C. Ames, a clever, generous, well-to-do gentleman, who had often accompanied the botanist on her explorations of Table mountain, and now continued his attentions. He fully appreciated her worth and talents, and she his great soul and devotion, so they were married in September 1871. Carefully providing his wife with presses, papers, receptacles and stamps, and always ready to carry her about the country with his fast trotters, wedded into the bogs or climb a rock for her flowers, he proves the best husband a lady engrossed in the expensive, non-paying pursuit of botany could have. Her parents also appreciated and assisted her, no child of the forest wild being sharper-eyed in the detection of flowers than her mother.

The father, a tall, noble gentleman of the old school, looked with proud satisfaction upon his fond daughters, and deeply enjoyed the success of each—Martha in the realm of letters as a newspaper correspondent, Mary in the floral kingdom winning honors and fame imperishable.

But the successful farmer must give close attention to dull details and delight in it. Mr. Pulsifer was a socialist, a philosopher. Having quit the digging of gold he could make it no other way. The farm passed into the hands of others, and father, mother and Martha returned to San Jose to renew the friendships of early times. Here the family met with the loss of its noble, divinely endowed head. Here died, September, 1874, Mr. Pulsifer, aged about 63, in the midst of warm friends, and supported by his wife and Martha, but far away from the loved and loving Mary.

Mary almost idolized her father, and the arrow of death nearly transfixed two where one was menaced. Mr. Ames, who had built up a home adjoining the old ranch, immediately sent for the stricken mother and Martha and has provided them a home with him for life, if they choose.

Mrs. Ames, rallying by the assistance of her mother, now doubly endeared, found in the continuance of her botanical surcease of sorrow, remembering the while how, in life, her proud father shared and heightened her triumphs. She made long excursions up, down and over the Sierra, barely escaping the total loss of sight in her zeal—happily now recovered. She reduced her large collection in order to facilitate their study.

Then, when questioning letters crowded every mail, she could readily pen a neat reply right to the point; so fully, so correctly, so cheerfully written, that every questioner was at once tempted to submit twice as many more. Thus Mrs. Ames has labored, thus she has been enabled to be of so much use to the editors of the "California Flora."

In long, fatherly letters from Dr. Gray, he gives her warm encomiums for zeal, knowledge and efficiency; and in his "Botanical Contributions," read before the American Academy of Arts and Sciences, he speaks of Mrs. M. E. P. Ames as one of the collectors on whom he chiefly relies for the flora of Northeastern California.

Among her collections are scores of plants rarely found before, and a dozen new ones, two of which (and perhaps more this winter) have been named in her honor, *Astragalus Pulsifera* and *Mimulus Pulsifera*.

When the first of these honors was announced to her, Mrs. Ames replied: "My spirit is dumb with joy! Oh, if my dear father had lived to share with me the joy of this hour, my happiness would be complete! How can I express the depths immense of endless gratitude I owe the good Dr. Gray!"

This extract, characteristic of Mrs. Ames' letters, is enough in conclusion to convey to the reader an idea of the mind, the heart, the spirit of this gifted child of nature, who reflects so much credit upon the region of the high Sierra where she lives and upon the State at large.

Calaveras County Quartz Mines.

It is entirely within the bounds of truth to say that the quartz mining interest of this section of the country never wore so favorable an aspect as it has this spring. New ledges are being discovered, abandoned mines reopened and mills being erected in all the districts. Capitalists are investing freely in mining property in several localities, and the work of development is being pushed with untold energy in every direction. There is no question but that this county offers better inducements to those wishing to engage in quartz mining enterprises than any other section of the State, and it is an encouraging fact that our advantages in that respect are beginning to be appreciated and utilized. Two of the more noteworthy reasons why Calaveras is the most inviting field for quartz operations, are the great number of ledges and the fact that the majority of them are as yet unprospected or in a state of partial development. The quartz belt in this county is fully fifteen miles in width, on an average, and the entire area is traversed by gold bearing lodes. There is yet abundant opportunity for obtaining claims by location, or promising veins, in almost any desired state of development, can be purchased at any reasonable figures. It is a knowledge of these advantages that is turning the attention of miners and capitalists towards this county, as offering the most favorable field for profitable labor and investment, and the effect is easily observable in the inception of new enterprises and the increased vigor with which operations are being pressed. With the influx of capital, largely increased milling facilities are being provided in all the districts, and the erection of machinery necessary for the proper working of the mines is promoting development to a degree hitherto unknown. That fully one-third more quartz will be milled in this county the present season than during any previous one, is not an extravagant assertion, and in view of the introduction of improved methods of working ores we are safe in saying that the gross yield will be engendered in still greater ratio.

At the Gwin, the principal mine in the county, the outlook was never before so wholly favorable. The 1100-foot level and its stopes are furnishing an abundance of first grade ore, and there are evidences that the pay chute will prove more extensive at the present depth than at any point nearer the surface. All the batteries are kept constantly employed, the product of the mine ranging from \$4,000 to \$5,000 per week. By good management the working expenses of the mine have been greatly diminished, without lessening the ore product. The work of sinking the shaft an additional hundred feet, for the purpose of opening a level at the depth of 1,200 feet, has been commenced. In the West Point district unusual activity is also noticeable. The principal mines—the Champion, Josephine, Mina Rice and others—are being worked steadily and with good results. In the Glencoe district also, operations are being pressed vigorously. The San Bruno, Gresham and other leading mines are in the hands of men of means, and with the aid of recently erected machinery are being systematically worked. Powerful hoisting works are shortly to be erected on the Glencoe Consolidated and other mines, and the prospects of the district are altogether cheering. In the Jesus Maria district sales of valuable mining properties have lately been made, and preparations for active work are progressing. Intelligence relative to operations in Sheep Ranch district is also flattering, the principal mines continuing to yield well with good prospects of several new enterprises being added to the list of paying claims. In fact, taken as a whole, the quartz mining interests of the county were never in so flourishing a condition, and beyond a doubt the present season will be the most prosperous one Calaveras has ever known.—*Calaveras Chronicle*.

In the Julia mine on the Comstock the face of the main drift on the 1800-ft level is developing a new feature in the shape of almost boiling hot water. This water is hot enough to scald, and is undoubtedly the result of the decomposition of minerals in the ledge at some point not very far away.

Alpine County Mining Interests.

Since the first settlement of this county, says the *Alpine Chronicle*, there never has been such healthy activity in mining interests as we are now daily witnessing in the several mining districts of Alpine. After years of neglect by the capitalists of our own State, for which, in a great measure, the early locators are responsible—they fearing that the Sacramentans and San Franciscans would "cinch" them too strongly, a reaction has occurred at the Bay city and the mines of Alpine county are now attracting the attention they should have received years ago. This better state of feeling toward our mines is the result of a radical change in our system of mining—the inauguration of shaft sinking, instead of the tunneling process, so long the curse of this county. Manager Chalmers, of the Exchequer mine—owned by a London company—was the first to change the programme that had become second nature to our people, and what is the result?—as soon as the iron horse and the screw propeller can do their work the London owners will have placed before them "silver bricks"—the best evidence that they can ask for as to the value of their Alpine possessions. The fine developments made in the Exchequer shaft have spurred on others, and the future of Alpine is no longer in a fog—it is as clear as the noon-day sun, that her treasure crop will not be second to the great Comstock itself! As an evidence of the increased interest in our mines we may state that a year ago the Exchequer, at Silver Mountain, was the only claim being worked, but now, with the Exchequer, we have the Advance, at Monitor, with a large three compartment shaft down 200 feet, and work going on, the Flint, also at Monitor, with a shaft down some 50 feet; the Illinois-California, in the Raymond district, running a tunnel now in over 1,200 feet with good prospects. In addition to these we learn that heavy machinery will be put on the Silver Cloud as soon as the roads will permit; and a new set of hoisting works with powerful machinery will be immediately put on the Advance, and also on the Flint. It is said that the Lady Franklin, I. X. L., and the Adolphus and Pine Tree, at Silver Mountain, will shortly be started up, and work will soon be inaugurated on the Marion, at Monitor, lately purchased by San Francisco parties. Negotiations are pending for a change in the ownership of two prominent mines here. Now is the golden opportunity for capitalists wishing to invest in mines to suit themselves on good terms, for in another year the value of mining property here will naturally increase as kindred properties are developed. What with the work already laid out and in contemplation, and that which will naturally follow in the wake of such enterprises, the coming summer will be the most prosperous season Alpine will have seen.

A New Water Jacket.

Last week we spoke of the new water jacket of the Defiance mining company, and in doing so inadvertently committed an error as to the inventor. Our information was obtained second-hand in regard thereto, but since another gentleman is entitled to honorable mention in connection therewith, we not only freely make the correction, but will endeavor to explain more fully the important points of the new jacket which makes it so preferable to the old style. The new water jacket is spoken of in the caveat filed for patent as the "Shepard & Rawlings' improved water jacket," and its main points consist in a combination of a steam and water chamber, which, by its peculiar construction, is connected with and joined to the top of the water jacket, the top being expanded all around six inches larger than the main jacket, and extending one foot above the same, the one foot extension above being lined with fire brick to prevent burning and an undue amount of heat of the water contained in the expanded top. What is claimed for this style of jacket is that it does not consume as much water, produces more steam, and consequently is a saving in the boiler generating steam to run the works; is much safer, not being liable to become dry and burn out, nor to any explosion. There are many other good points claimed for this water jacket, among which is a peculiar opening in front to facilitate the cutting out of a "bank" or cleaning the furnace, which can be done in much less time and at much less expense than in those of the old style. The steam drum, or expanded top, is an invention of Mr. J. H. Rawlings, who is a practical inventor, and is now employed as engineer of the Defiance furnace. The front opening for the easy cleaning of the furnace or cutting out of a "bank" is the invention of L. F. Shepard, who has been a practical furnace man at Cerro Gordo and other places for the past five years, and is now employed at the Defiance furnace as superintendent. As this new jacket is now on its first trial we shall watch with peculiar interest its operation, and of its success or failure we shall have more to say hereafter.—*Osos Mining News*.

In the Best & Belcher mine nothing is doing at present, the north drift on the 1700-ft level connecting with the Gould & Curry having been repaired, and the temperature being too great to yet attempt to cross cut. The Best & Belcher is equally interested in the new pumping machinery now being erected by the Gould & Curry, and must wait until the improvements on the shaft and the erection of the machinery is completed, before the development of the lower levels can proceed.

MECHANICAL PROGRESS.

How a Hatchet is Made.

As an illustration of the ever advancing progress in machinery, we quote from the *British Trade Journal* the way hatchets are made in one of the large Sheffield establishments: The long bar of iron out of which they are made is cut into lengths, called molds, by powerful shears. One of these molds is heated to bright redness, and a piece of steel welded on to the central part, to form the poll of the hatchet. One-half the length of the mold on each side of this central part is then thinned and drawn out sideways into projections, after which the work is folded at the central part round a tapering mandril of the section of the intended eye, and welded across the line of demarcation between the extended portions and the untouched tails. The tapering mandril is then again introduced into the hole from both sides, so that the handle when fitted and wedged in will hold it firmly. A slip of best cast steel is then inserted between the tails, as yet of their original size, up to the first weld, and all three are welded to the proper extent. The work is then put into a hollow fire, and the combined iron and steel drawn out sideways to the required width under the tilt hammer. The hatchet is then flattened and smoothed with the hammer; the edges are pared with the shears and trimmed with a round-faced hammer or top faller, the parings being afterward sent to the gun-barrel makers. After being ground on Derbyshire or Yorkshire stones it is glazed on a "hoh" or wooden wheel, covered with leather charged with emery. If not intended to be ground all bright, the part left unground is generally blued or black japanned. It is then "treed up" by the insertion of the helve or handle. For the handles of tools, $1\frac{1}{2}$ inch ash-wood planks are sawn into sheps by a circular saw, and the rough shapes turned in lathe, self-acting lathes being employed in the largest manufactories.

A New Rail Making Experiment.

At the Wyandotte rolling mill, at Wyandotte, near Detroit, Mich., recently, railroad rails were made of iron base and Bessemer steel head so successfully welded that the most trying tests failed to show even the joint of the juncture of the two metals. The same experiments showed the welded rail even better than the solid Bessemer steel. Each was submitted to 60 blows by a 20-ton hammer. The Bessemer rail was completely shattered, cracked through and through in every direction; the welded rail, though mashed down and twisted in the neck, showed no sign of a fracture in any part. The *Detroit Post* says this feat was accomplished by the use of a peculiar metalloid sponge or flux in the following manner:

The pile is made up as for the ordinary iron rail. For the head, scrap of steel, hitherto not utilized at all, are spread of the desired thickness, and upon this is laid a plate of steel. The flux, in the shape of hard substance about the size of a kernel of corn, is scattered through and over the pile, which is then placed in the oven. When properly heated, it is drawn and rolled in the ordinary manner. It is found to be a perfectly homogeneous mass; the fibrous iron, the crystalline steel, have their particles so interwoven that it is a physical impossibility to separate one from the other. Breaking or twisting does not produce a separation at the point of juncture. The wonderful work of uniting iron and steel, so mechanically different, into one homogeneous mass, is accomplished by the peculiar flux, composed of 55 parts iron, 20 parts silicon, and 25 parts aluminum. The chemical action of these substances is explained to be as follows: The silicon takes up all the alkaline matter, while the aluminum eliminates the free oxygen, phosphorus and sulphur, thus making a uniform, consistent, close-grained metal.

THE HILL CLIMBING ENGINE.—The novel contrivance known as the hill climbing engine continues to excite much interest in France. This engine, as described, has no wheels, and consequently does not roll, but in place of them is furnished with what are termed legs, upon which it accomplishes the purpose in view. It is like an ordinary engine in most respects, but is equipped with straight rods, terminating in broad circular skates. There are three of these legs in front and three behind. The cylinders, in place of actuating wheels, raise the feet. The apparatus is claimed to be especially adapted for carrying great weights up railway inclines. One of them, weighing 10 tons, is represented as running four or five miles an hour, and can accomplish $12\frac{1}{2}$ miles if desired.

A LONG RUN.—The Uniontown (Pa.) *Genius of Liberty* says: Dunbar furnace has "blown out" after a most successful blast of five years and six and a half months, during which time she has made 66,083 net tons of iron, including 6 per cent. of No. 1 foundry, 7 per cent. of No. 2 foundry, 79 per cent. of No. 1 gray forge, 4 per cent. of close gray forge, 2 per cent. of mottled and 2 per cent. of white. We believe that this is the largest blast on record of any furnace west of the mountains, and while some furnaces in the East have been in longer, we cannot recall as large an amount of iron made on a single blast.

Miniature Machinery at the Centennial.

In one of the ten by twelve wings of the Centennial machinery building will be exhibited a working model of a section of the Pennsylvania oil producing regions. The operation of erecting well-derricks, drilling wells, and of pumping and flowing oil wells, are illustrated, and a model of an oil refinery is shown, in front of which a small locomotive engine will be run with an attached train of Empire line oil cars, such as are used for the transportation by rail of the refinery product.

The other of the ten by twelve wings of the building is to be occupied by an exhibit designed to illustrate the important pipe-line interests of the Empire transportation company. An oil well and fixtures will be shown, together with a completely appointed pipe-line station in actual operation; also, a model of a pipe line, office, telegraph line, etc. The production of the model oil well is received at the pumping station, and forced through a line of pipe to a receiving tank located on an elevated portion of the counter adjacent to the railroad track. From this receiving tank the oil runs by gravity to a loading truck where a model tank oil car is loaded.

After the car is loaded it is then run to the other side of the building, where the oil is discharged into an underground tank, as is customary at the terminal delivery points of the Empire transportation company. On the six-foot counter, adjacent to the place where the oil is unloaded, there will be a small model exhibiting, in full and accurate detail, the arrangement of one of the terminal seaboard depots provided by the company for the extensive handling of crude and refined petroleum.

THE HUDSON RIVER BRIDGE.—The contract for the construction of the great Hudson river bridge has been given to the Keystone bridge company, of Pittsburgh. The general plan of the bridge is a suspended girder, with parallel and cradled cables, and two decks, one upon and one within the girder. There will be a great girder of wrought iron, 1,680 feet long, carried by wrought iron towers and cables of steel links and pins, the cables to be anchored in solid rock. On the upper deck is to be a double-track railway, and on the lower deck a carriage way of 16 feet in width in the clear. Each link of the cables will be subjected to a strain of 20,000 pounds to each square inch of section; the steel used in the links and pins is to have a limit of elasticity, without set, of 40,000 pounds to square inch of section of original area, and a final breaking strain of at least 50,000 pounds to the square inch. The towers are made of cells of wrought iron to the height of the tract of the railroad, which is to be 190 feet above high water; above the tracks there are to be eight columns, 11 feet in diameter and 80 feet high.

THE FIRST IRON PLANER.—The *Iron Trade Exchange* states that the first machine for planing iron was built by the elder John Rennie, in London. The following is from an original memorandum book of the late George Rennie: "In March, 1814, the following plan was adopted for chipping the cast iron sides of a new lathe. The sides are placed close together, with their faces upward; two planks of elm, one on each side, are bolted with their edges truly placed and upward; upon the edges of the planks run four wheels on axles, which support a truck of oak. To the truck is fixed a slide-rest, to which is attached a cutting tool; the truck is well loaded with weights, and pulled along the surface of the elm planks by means of a crab and chain. Thus the tool planes the iron lathe beds straight." This was, in fact, the first planing machine, crude and rude as it was, and from it Whitworth, to whom the original apparatus was shown, subsequently made a self-acting machine.

TO DRILL INTO HARD STEEL.—Make your drill oval in form, instead of the usual pointed shape, and temper as hard as it will bear without breaking; then roughen the surface where you desire to drill with a little diluted muriatic acid, and, instead of oil, use turpentine or kerosene, in which a little gum camphor has been dissolved, with your drill. In operating, keep the pressure on your drill firm and steady; and if the bottom of the hole should chance to become burrished, so that the drill will not act, as sometimes happens, again roughen with diluted acid as before; then clean out the hole carefully, and proceed again.

DISTANCE REGISTER.—A Scotchman announces the invention of a method of checking distance traveled by passengers in cars or wheeled carriages. It is described as a method which involves the use of a dial, provided, like an ordinary clock face, with hour and minute hands, the motion of which would be determined by the motion of the car, and at once enable both passenger and conductor to learn what distance the former had traveled when he wished to leave the car.

A BIG DIVING BELL.—A diving bell, 12 feet in diameter and 10 feet 6 inches high, was turned out of the Perseverance works, Deptford, Eng., and drawn by six horses to the West India docks for shipment to Barbadoes. It is intended to be used in the construction of new docks and breakwater.

SCIENTIFIC PROGRESS.

The Vibrations of Tuning Forks.

At the annual meeting of the National Academy of Science at Washington, April 20th, Prof. A. M. Mayer read a paper describing some ingenious experiments on the vibrations of tuning forks. It appears that tuning forks are now largely used for determining short periods of time, by means of apparatus involving their vibrations. Among these uses, one of the most prominent is in ascertaining the rate of flight of projectiles; another is for pathological experiments upon the rate and character of the pulse; still another is connected with telegraphy, both as to the absolute speed of the electric current and as to determinations of longitude. But the results obtained in these researches are slightly vitiated by errors of which the sources and laws have been as yet very little ascertained. It has been customary to ascribe the greater portion of these errors to differences of temperature. Instruments have been constructed at great expense to indicate the exact measure of time taken by tuning forks for their vibrations, but little certainly was obtained because of the difficulty of making the recording cylinders revolve, and the rest of the apparatus conform, with the needful accuracy.

Prof. Mayer has contrived an instrument in which variations of the rate of revolution of the recording cylinder do not affect the point at issue. He first fixes a pointed rod at the end of a pendulum (moved by a clock) so that the point, when at the lowest part of each beat, shall touch a globe of mercury. This touch to the globe completes an electric circuit leading to a tuning fork which is standing so close to a revolving cylinder that when the fork is vibrating a point on the fork describes a wavy line on the cylinder. (If the fork were not vibrating, it would mark a straight line on the cylinder when the latter is rotated.) At the instant of contact between the pendulum and mercury, a spark passes from the point on the fork to the cylinder. Upon the cylinder there is stretched a sheet of smoked paper, on which the wavy line of vibration is continually traced. When the spark passes, it goes through the paper. Two or three sparks may come with the contact, but only the first one goes through the paper. Thus the length of time between the beats of the pendulum is measured on the wavy line, and, as the number of waves in the line is the number of vibrations of the tuning fork, it follows that by counting the number of waves between each spark-hole, we have the number of vibrations of the fork in a given time, say a second. Evidently the rate of revolution of the cylinder is not concerned, as the only difference, whether that goes fast or slow, is to make the waves closer together or wider apart on the record; the number of waves remains unaffected. Prof. Mayer exhibited several of these records which had been fixed by dipping the blackened paper in a thin varnish.

Prof. Mayer first tested the correctness of the forks—which come stamped with a note that should indicate exactly a certain number of vibrations in a second. At 69 deg. Fah. he found only one fork in six was correct; one was three beats, another five beats, another 12 beats in 60 seconds out of the way.

MEASURING THE DEPTH OF THE SEA.—An ingenious instrument has recently been invented in England by Mr. C. William Siemens, for determining the depth of the sea without the use of a sounding line. Hung up in the cabin of a ship, it will at any moment indicate what is the depth of the water below. In an illustrated description of the instrument in *Nature*, the principle of construction is shown to depend on the variations in gravity which result from the interposition at sea of water, which has less attractive force than earth for a body on its surface. The attraction of gravity is determined by the density of the earth, which may be roughly estimated as about the average of surface rock, and about five and one-half times that of sea water. Consequently if a ship could be weighed in a spring balance, it would be found lighter when on the deepest water. In Mr. Siemens' device, a column of mercury is hung in a spring balance, and very delicate contrivances indicate the exceedingly slight differences in weight. It will give a notion of the delicacy of the instrument to mention that the record it gives for change of latitude is far greater than for sea depths, and has to be allowed for in calculation; of course this should be the case, since the earth is $26\frac{1}{2}$ miles thicker at the equator than at the poles. Tested by the soundings of the *Challenger*, the readings of the instrument have proved remarkably accurate. When the contour of the ocean bed is better ascertained, the means will thus be afforded to the mariner of ascertaining his position, by studying the indications of this index to the depth of water beneath him when the sky is too much clouded for observation. A contrivance for showing the difference in the earth's thickness by means of a weight suspended from a spring is figured in Herschel's "Outlines of Astronomy," but we are not aware that any practical use was made of it, if indeed it was ever constructed.

The Great French Reflector.

The great reflector of the Paris observatory is at last completed. Its mirror is of silvered glass, 1.2 meters (almost exactly four feet) in diameter, and with a focal length of eight meters, or a little more than 26 feet. The instrument is arranged as a so-called Newtonian—i. e., the observer is placed near the open end of the tube and looks into it at right angles to the direction in which it is pointed, the light being sent to the eye by a small flat mirror set at an angle of 45 deg. in the center of the tube. The performance is said to be very fine, but of this we can judge better when it works appears. The telescope is mounted in the open air, on an equatorial stand of peculiar construction, which from the figures looks as if it might be troubled by vibrations, as the polar axis, supported at both ends after the old English fashion, appears rather long and springy. The observer reaches his position by a sort of movable tower, which travels on a circular railway. When the instrument is not in use it is covered by a shed, which can be rolled off upon rails when not wanted. Only one reflector of greater power than this has ever been constructed—that of Lord Rosse, six feet in diameter. Three others have been built of the same size: the famous four-foot telescope of the elder Herschel (long ago dismantled), the great reflector of Mr. Lassell, and the telescope of the Melbourne observatory. Next to it rank among reflectors the smaller instrument of Lord Rosse, three feet in diameter; the instrument of the Marseilles observatory, which has a silvered glass mirror 08.10 of a meter (31 inches) in diameter; and that of Dr. Henry Draper, which has an aperture of 28 inches. The optical part of the Paris telescope is by Martin; the mechanical by Eichen. It is to be under the charge of M. Wolf, who will employ it chiefly upon the planets and their satellites. A gigantic refractor is also under way for the same observatory, to have an aperture of 30 inches; but it will be some years before its completion.

MICROSCOPY AT THE AMERICAN ASSOCIATION.—At the Detroit meeting of the American association for the advancement of science, last August, the microscopists who were in attendance decided to organize permanently an subsection or club, connected with the association. To allow ample time for preparation, and to facilitate the co-operation of all interested parties, it was decided to adjourn for one year, and to proceed with the organization at the Buffalo meeting of the association, which commences on the third Wednesday of August next, and continues about one week. All persons interested in the microscope, and desirous of joining such an organization as is now proposed, are invited to be present and co-operate, whether at present members of the association or not, and are requested to bring to the meeting original papers of scientific interest upon subjects connected with the microscope and its work, and also to bring instruments, accessories, and objects, especially those illustrating new or unfamiliar inventions, contrivances and discoveries.

THE SOLAR PROTUBERANCES.—For some time past the protuberances on the sun's surface have appeared less numerous. Father Secchi states the minimum is, however, not yet attained, and this is shown by the sudden changes in the phenomenon. On one day scarcely more than three protuberances can be found, while on the following day they may be counted by dozens, evidencing the fact that the solar activity in course of diminution suddenly, from some unknown cause, renews itself. Father Secchi also notes the rectilinear form of the hydrogen eruptions, which, with a thickness of several seconds, rise without deviation to a distance of two or three minutes (equal to 60 terrestrial diameters) from the sun's edge. The solar atmosphere is now so calm that the expansion, which takes place at the extremity of the incandescent columns, appears perfectly symmetrical on the two sides of every jet.

ATMOSPHERIC AMMONIA.—M. Schloesing has recently studied the exchange of ammonia which takes place between water and the atmosphere. The water which condenses in the clouds and which falls in rain would at first sight appear to despoil the air of all the ammonia contained. Such, however, is far from being the case. Sixteen analyses conducted at different temperatures show that the water never dissolves all the atmospheric ammonia. At 77 deg. Fah., the water takes up but 3 per cent. of the total amount of ammonia in the air; at 68 deg., 4 per cent.; at 59 deg., 6 per cent.; at 50 deg., 11 per cent.; and, finally, at 41 deg., 19 per cent. From this it appears that the lower the temperature the greater is the amount of ammonia dissolved.

NEW TEST FOR BORACIC ACID.—If a borate be finely pulverized in an agate mortar, and then introduced into an elongated loop of a platinum wire containing glycerine, and the mass is then held in the flame of a Bunsen burner for a few seconds, the glycerine will catch fire and burn with a beautiful green flame, leaving a carbonaceous residue. This test has been applied to over a dozen borates, and also to many minerals containing boracic acid, with perfectly satisfactory results. The students of the qualitative laboratory at the School of Mines, Columbia college, have used this test for two months with perfect success.

MINING SHAREHOLDERS' DIRECTORY.

ASSESSMENTS.—STOCKS ON THE LIST OF THE BOARDS.

Company.	Location.	No.	Amt.	Leased.	Deling't.	Sale.	Secretary.	Place of Business.
Adams Hill Con M Co	Enreka Nev	7	25	May 2	June 12	July 7	W W Traylor	399 Montgomery st
Baltimore Con M Co	Washoe	11	100	Mar 28	May 1	May 20	O A Sankay	331 Montgomery st
Calaveras Con M Co	Nye Co Nev	8	110	Mar 29	May 23	May 23	W H McCall	330 Front st
Caladonia S M Co	Washoe	17	100	Apr 18	May 22	June 9	R Wexner	414 California st
Cosmopolitan M Co	Nev	3	25	May 1	June 5	June 23	M Sanders	307 Montgomery st
Crescent M Co	Washoe	25	100	May 10	May 10	May 31	O E Elliot	115 California st
Great E. tern Con Q M Co	Washoe	20	100	May 11	May 12	May 29	R Beyer	331 Montgomery st
Hala & Norcross Con M Co	Washoe	50	150	May 16	June 21	July 12	F J Lightner	Nevada Block
Hussey Con G & S M Co	Cornuponia	1	15	Apr 5	Apr 18	June 6	R H Brown	402 Montg mary st
Kaibab-hock M Co	Washoe	15	100	Mar 31	May 23	May 23	H H Brown	330 Front st
Ledy Bryan M Co	N-v	11	100	Mar 27	Apr 27	May 13	W H McCintock	419 California st
Leopard M Co	Elito Co Nav	1	100	Mar 31	May 3	May 22	R H Brown	402 Montgomery st
Meadow Valley M Co	Ely District	11	100	Apr 26	June 3	June 20	T W Colburn	418 California st
Merced M Co	Washoe	12	20	May 1	June 2	June 23	J A Langage	401 California st
Nawark S M Co	Ely District	12	50	May 16	June 20	July 11	Wm Willis	309 Montgomery st
Niagara G & S M Co	Washoe	2	50	May 1	June 1	June 20	W R Townsend	Nevada Block
Northern Nevada S M Co	Washoe	4	45	May 1	June 6	June 20	R R Townsend	Nevada Block
Prospect G & S M Co	Washoe	1	100	Apr 24	June 23	June 23	J P Brown	320 California st
Savage M Co	Washoe	23	20	Apr 4	May 9	May 27	E B Holmes	309 California st
See Balcher S M Co	Washoe	15	50	Apr 11	May 1	June 6	Geo D Edwards	414 California st
Shoshone M Co	Washoe	4	10	Apr 6	May 6	June 23	J M Kingston	331 California st
Star King S M Co	Nev	13	10	May 4	June 1	June 23	J Kaplan	Merchans E
Suconer M Co	Washoe	14	50	Apr 17	May 22	June 12	W H Watson	302 Montgomery st
Trojan M Co	Washoe	2	60	Apr 9	June 11	July 3	D Wilder	323 Montgomery st
Union M Co	Elito Co Nev	2	20	Apr 18	May 18	June 18	D Jennings	401 California st
Yellow Jacket S M Co	Washoe	22	100	Mar 18	Apr 21	May 24	O W Hopkins	Gold Hill
OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.								
Alameda Coal M Co	Cal	1	10	Mar 17	Apr 30	May 30	F Bodge	409 Battery st
Amador Con M Co	Nev	8	10	Apr 21	May 27	June 17	J M Buffington	411 California st
Black Hawk Coal Co	Cal	5	10	Mar 15	May 20	June 10	H A Fowler	520 Montgomery st
Carrie & Hays Granite M Co	Cal	3	10	Mar 18	Apr 10	June 20	S J Raynolds	520 Montgomery st
Columbia M Co	Washoe	1	25	Apr 15	May 1	June 6	Frank Swift	418 California st
Connellia Black Sand G M Co	Oregon	2	40	Apr 13	May 15	June 6	P P Reynolds	111 1/2 Leidsdorff st
Conover M Co	Cal	1	15	Mar 15	May 20	June 10	F Bodge	22 California st
Denver C O Co	Sonoma Co Cal	1	75	Apr 5	May 16	June 8	A G Swarth	Nevada Block
Enterprise Con M Co	Cal	7	10	Mar 20	Apr 29	May 23	F J Hermann	418 Kearny st
Equitable Tunnel & M Co	Utah	12	20	Mar 13	June 5	July 5	C S Healy	Marchants' E
Flint Hills & M Co	Cal	1	10	Mar 13	Apr 10	June 10	309 Montgomery st	Cor Cal & Mont'y st
Globe Con M Co	Washoe	8	25	Apr 19	June 1	June 20	P M Mollassen	309 Cal & Mont'y st
Green Valley Blue Gravel Co	Cal	5	25	Mar 29	May 3	May 26	A D Carpenter	805 Clay st
Hope Quicksilver M Co	Cal	1	21	May 12	June 17	July 10	Jacob Hardy	408 California st
Imperial Hill G M Co	Cal	6	250	May 1	June 17	July 10	W H Hermann	418 Kearny st
Iris M Co	Utah	2	25	May 2	June 2	June 27	F Madga	Marchants' E
Jafferson S M Co	Nye Co Nev	1	75	May 5	June 9	June 30	O A Sankay	331 Montgomery st
Kearney Con M Co	Cal	12	100	Mar 28	May 3	June 10	F Bodge	418 Kearny st
Mariposa Franklin G & S M Co	Cal	50	3	Mar 3	May 15	June 5	F E Luty	507 Montgomery st
Mariposa Land & M Co	Cal	5	04	May 2	June 3	June 30	L Leavitt	309 Montgomery st
Modoc Con M Co	Inyo Co Cal	1	04	May 3	June 16	July 10	P M McLaren	318 Montgomery st
Modoc Con M Co	Inyo Co Cal	1	04	May 3	June 16	July 10	P M McLaren	318 Montgomery st
Nonpareil G M Co	Tuolhume Co O	1	00	May 9	June 12	July 3	A Du Prat	306 Jackson st
North Oarson S M Co	Nev	4	25	Apr 29	June 1	June 12	W A N Van Bokkelen	3 S Sansome st
Omaga T M Co	Cal	10	5	Apr 19	May 22	June 24	David Wilder	326 Montgomery st
Omaga T M Co	Cal	1	20	Apr 20	May 23	June 20	John R Knap	418 Kearny st
Reliance M Co	Washoe	1	10	Apr 13	May 15	June 1	David Wilder	328 M ngm'ty st
Representative S M Co	Washoe	3	25	March 30	May 22	June 12	T L Cowe	Virginia, Nev
Rising Star M Co	Cal	1	10	May 16	June 1	June 10	J H Chapage	330 Pine st
Rising Star M Co	Cal	2	210	May 16	June 5	June 29	J E Jozz	Virginia, Nev
Ronab & Ready M Co	Washoe	1	10	Apr 28	June 1	June 17	O H DeSance	418 California st
San Jose M Co	Nev	12	500	Mar 18	Apr 15	May 23	A Oarrigan	109 Front st
San Jose M Co	Nev	1	10	Mar 18	Apr 15	May 23	F B Bogan	323 Montgomery st
Stock B-oker M Co	Cal	1	10	Mar 28	May 6	May 31	O H Boreat	323 Montgomery st
Taylor M & M Co	Garden Valley Dist	1	20	May 15	June 21	July 6	S M Kneff	607 Montgomery st
White Mountain M Co	Amador Co Cal	1	5	Mar 25	May 1	May 22	S K Nicbols	215 Sansome st

LATEST DIVIDENDS (within three months) MINING INCORPORATIONS

MEETINGS TO BE HELD.					
Name of Co.	Location.	Secretary.	Office in S. F.	Meeting.	Date.
Alabama M Co	Oal	W H McClintock	419 California st	Annual	June 1
Almaden Con Quicksilver M Co	Oal	P Mathews	346 California st	Special	May 30
Black Bear Quartz M Co	Cal	W Lettis Oliver	419 California st	Annual	June 1
Florida M Co	Washoe	Called by Trustees	320 Sansome st	Special	June 1
Hussey Con G & S M Co	Nev	R H Brown	424 California st	Annual	May 2
John Franklin G & S M Co	Nev	F E Lett	507 Montgomery st	Annual	June 1
Queen M Co	Cal	W H McClintock	419 California st	Annual	June 1
Silver Hill M Co	Nev	Called by Trustees	419 California st	Special	May 2

LATEST DIVIDENDS (within three months)—MINING INCORPORATIONS.					
Name of Co.	Location.	Secretary.	Office in S. F.	Amount.	Payable.
Alps S M Co	Ely District	O D Snire	Stevensons Bldg	50	April 1
Belcher M Co	Washoe	H O Kibbo	419 California st	1 00	April 1
Black Bear Quartz	Cal	L Oliver	316 California st		May 1
California Co	Washoe	O P Gordon	309 Montgomery st	2 00	May 1
Con Bird Hill Quartz M Co	Washoe	R Wagner	41 California st	25	April 1
Cos Virginia M Co	Washoe	Chas H Fish	401 California st	2 00	May 1
Empire M Co	Nevada Co Cal	D A Jennings	401 California st	2 00	April 1
Empire M Co	Sierra Co Cal	Chas Collinsbourn		2 00	April 1
Empire M & M Co	Washoe	W E Dean	414 California st	5 00	April 1
Imperial S M Co	Washoe	W E Dean	414 California st	25	April 1
Leopard M Co	Nev	R H Brown	402 Montgomery st	75	Feb 1
Northern Belle M & M Co	Cal	W Willis	309 Montgomery st	1 00	May 1
St Patrick M Co	Cal	D F Verinalen	409 California st	30	Mar 1
West Hornstock G & S M Co	Washoe	Oliver G Wood	534 California st	30	Feb 2

California Stock Board.

METALS.

[WHOLESALE.]

THURSDAY, M., May 18th, 1876.

200 ...do.....	2.31/34	230 Eureka Con.....	11 1/2 @ 1 1/2	260	
50 ...do.....	3.30, 31/34	200 Forrest.....	80	260	
100 ...do.....	3.30, 31/34	600 Gila.....	16 1/2 @ 1 1/2	260	
100 New York.....	1 1/2 @ 1 1/2	1850 Col or Charol.....	25 @ 2 1/2	260	
200 Ohio.....	1 1/2 @ 1 1/2	200 Gold & Curry.....	1 1/2 @ 1 1/2	260	
260 ...do.....	3.5 @ 3 1/2	16 Gold Run.....	3 1/2 @ 3 1/2	260	
160 ...do.....	5.5 @ 5 1/2	70 Hale & Nor.....	55 @ 5 1/2	260	
10 ...do.....	2.5 @ 2 1/2	410 Idaho.....	75 @ 7 1/2	260	
100 Railroad.....	2.5 @ 2 1/2	70 Jaffeson.....	75 @ 7 1/2	260	
75 Succor.....	2 1/2 @ 2 1/2	70 Luccor.....	5 1/2 @ 5 1/2	260	
20 Sierra Nevada.....	1.16 @ 1 1/2	350 Lady Bryan.....	14 @ 1 1/2	260	
10 ...do.....	1.16 @ 1 1/2	21 Lead Valley.....	1 1/2 @ 1 1/2	260	
200 West Point.....	5.5 @ 5 1/2	300 Mexican.....	32 @ 3 1/2	260	
1130 Yal Jacket.....	3 1/2 @ 3 1/2	100 New Coso.....	7.00	260	

AFTERNOON SESSION.

45 Alps.....	2 1/2 @ 2 1/2	350 Ophir.....	55 1/2 @ 5 1/2	260	
40 Bes & Belcher.....	58 @ 5 1/2	300 Fuma.....	10 @ 10	260	
160 Belcher.....	22 @ 2 1/2	0 Raymond & E.....	13 1/2 @ 13 1/2	260	
200 Bonanza.....	1.16 @ 1 1/2	20 S.vage.....	20 @ 2 1/2	260	
350 Coso Con.....	3 1/2 @ 3 1/2	150 Sierra Nevada.....	16 1/2 @ 1 1/2	260	
845 Cos Imperial.....	6 @ 6 1/2	150 Union.....	12 @ 12	260	
250 ...do.....	10 @ 10 1/2	100 ...do.....	3.12 @ 3 1/2	260	
100 ...do.....	3.30 @ 3 1/2	91 ...do.....	5.30 @ 5 1/2	260	
50 ...do.....	5.30 @ 5 1/2	20 ...do.....	10 @ 10 1/2	260	
100 ...do.....	3.30 @ 3 1/2	10 Yellow Jacket.....	3 1/2 @ 3 1/2	260	
50 ...do.....	5.30 @ 5 1/2	100 ...do.....	5.1 @ 5 1/2	260	
2400 Comet.....	5.30 @ 5 1/2	450 ...do.....	3 1/2 @ 3 1/2	260	
50 Crown Point.....	1.16 @ 1 1/2	100 ...do.....	3 1/2 @ 3 1/2	260	
70 Crown Point.....	1.16 @ 1 1/2	100 ...do.....	5.3 @ 5 1/2	260	
100 English.....	1.16 @ 1 1/2	100 ...do.....	5.3 @ 5 1/2	260	

California Stock Board.

WEDNESDAY, A. M., MAY 17.

200 Alps.....	1 1/2 @ 1 1/2	20 Trojan.....	37 1/2 @ 3 1/2	260	
100 Andes.....	2.70	25 Union Con.....	1 1/2 @ 1 1/2	260	
200 Brooks.....	3 @ 3 1/2	50 Ward.....	1 1/2 @ 1 1/2	260	
340 Baltimore.....	2 1/2 @ 2 1/2	300 Wells Fargo.....	27 1/2 @ 2 1/2	260	
300 Belcher.....	2 1/2 @ 2 1/2	250 Yellow Jacket.....	3 1/2 @ 3 1/2	260	
75 Belcher.....	2 1/2 @ 2 1/2	AFTERNOON SESSION.			260
10 Bes & Bel.....	2 1/2 @ 2 1/2	20 Andes.....	2 1/2 @ 2 1/2	260	
75 California.....	5 1/2 @ 5 1/2	100 Brooks.....	3 @ 3 1/2	260	
100 Cos Belcher.....	4 1/2 @ 4 1/2	20 Bast & Belcher.....	3 1/2 @ 3 1/2	260	
100 Columbia.....	6 1/2 @ 6 1/2	300 Cosmon.....	1 1/2 @ 1 1/2	260	
1005 Cos Imp.....	5 1/2 @ 5 1/2	21 Cuckoo.....	8 1/2 @ 8 1/2	260	
20 California.....	8 @ 8 1/2	616 Cos Imperial.....	6 1/2 @ 6 1/2	260	
85 Crown Point.....	16 @ 16 1/2	10 Rachequa.....	2 1/2 @ 2 1/2	260	
100 Dayton.....	1 1/2 @ 1 1/2	900 Edinburgh.....	37 1/2 @ 3 1/2	260	
100 Kildurgun.....	5.00	100 Golden Union.....	1 1/2 @ 1 1/2	260	
300 Exobeguer.....	2 1/2 @ 2 1/2	40 Glasgow.....	16 @ 16 1/2	260	
50 Golden Union.....	2.50	600 Jenny Glyn.....	15 @ 15 1/2	260	
70 Hussey.....	1 1/2 @ 1 1/2	600 Julia.....	13 @ 13 1/2	260	
50 Julia.....	12 @ 12	425 Mansfield.....	2 1/2 @ 2 1/2	260	
250 Kildurgun & F.....	8 1/2 @ 8 1/2	40 Monumental.....	20 @ 20 1/2	260	
50 Lady Bryan.....	1 1/2 @ 1 1/2	60 New Coso.....	3 1/2 @ 3 1/2	260	
50 Lavishian.....	6 1/2 @ 6 1/2	300 N. Mon.....	3 1/2 @ 3 1/2	260	
40 Lady Washington.....	2 1/2 @ 2 1/2	50 Occidental.....	4 1/2 @ 4 1/2	260	
100 Little York.....	2 1/2 @ 2 1/2	301 Occidental R. W.....	2 1/2 @ 2 1/2	260	
750 Mansfield.....	25 @ 25 1/2	40 Panther.....	2 1/2 @ 2 1/2	260	
100 Mint.....	35 @ 35 1/2	20 Railston.....		260	
700 Monumental.....	25 @ 25 1/2	20 Raymond & E.....	13 1/2 @ 13 1/2	260	
250 Mexican.....	2.50	50 South Charlot.....	25 @ 25	260	
195 New York.....	1 1/2 @ 1 1/2	300 Sunnor.....	85 @ 85	260	
25 N Con Virginia.....	1 1/2 @ 1 1/2	2000 Stock Broker.....	12 @ 12	260	
20 North Carbon.....	1 1/2 @ 1 1/2	100 South Ophir.....		260	
250 North Carbon.....	1 1/2 @ 1 1/2	100 Shasta.....		260	
121 Ophir.....	55 1/2 @ 5 1/2	21 Union Con.....	12 1/2 @ 12 1/2	260	
300 Phil Sheridan.....	27 1/2 @ 27 1/2	100 Wells Fargo.....	27 1/2 @ 27 1/2	260	
2 Silver Rest.....		250 Yellow Jacket.....	3 1/2 @ 3 1/2	260	
190 South Carbon.....				260	
200 Suvaco.....	16 1/2 @ 16 1/2			260	
950 Senator.....	53 @ 53			260	
200 Teton Peaks.....	1 1/2 @ 1 1/2			260	

Amerleon Pig Iron, 3 ton.....	33 00 @ 36.00		
Sooty Pig Iron, 3 ton.....	33 00 @ 37.00		
Whita Pig, 3 ton.....	28 00 @ 32 51		
Oregon Pig, 3 ton.....			
Bathed Bar, 10 lb.....	6 1/2 @ 6 1/2		
Boiler, No. 5 to 9.....	6 1/2 @ 6 1/2		
Sheet, No. 10 to 14.....	5 1/2 @ 5 1/2		
Sheet, No. 16 to 20.....	5 1/2 @ 5 1/2		
Sheet, No. 22 to 24.....	6 1/2 @ 6 1/2		
Sheet, No. 26 to 28.....	6 1/2 @ 6 1/2		
Horse Shoes, per keg.....	6 50 @ 8 00		
Neathing Yellow.....	9 1/2 @ 9 1/2		
Norway Iron.....	9 1/2 @ 9 1/2		
Rolled Iron.....	9 1/2 @ 9 1/2		
Other Irons for Blacksmiths, Miners, etc.	9 1/2 @ 9 1/2		
Copper.....	37 1/2 @ 37 1/2		
Copper Tin'd.....	24 00 @ 25 00		
Sheathing, B.....	10 00 @ 10 00		
Neathing Yellow.....	10 00 @ 10 00		
Sheathing, Old Yellow.....	12 00 @ 12 00		
Composition Nails.....	24 00 @ 24 00		
Composition Bolts.....	24 00 @ 24 00		
Strips, English Cast.....	20 00 @ 25 00		
Anderson & Woods American Cast.....	15 00 @ 15 00		
Drill.....	15 00 @ 15 00		
Flat Bar.....	15 00 @ 15 00		
Pivot Steel.....	9 00 @ 9 00		

TIN PLATES.

10x10 Charcoal.....	10 00 @ 10 50		
10x12 Charcoal.....	10 50 @ 11 00		
Roofing Plate 10 Charcoal.....	10 00 @ 10 00		
Banca Tin.....	26 00 @ 28 00		
Australian.....	18 00 @ 22 00		
Zinc, Sheet 13 1/2, No 7 to 10 P.D.....	11 00 @ 11 00		
do do 7x3 ft, No 1 to 4.....	11 00 @ 11 00		
do do 8x16, No 1 to 4.....	12 00 @ 12 00		
do do 10x16, No 1 to 4.....	12 00 @ 12 00		
NAILS Assorted sizes.....	3 60 @ 3 75		
QUICKSILVER, per lb.....	8 55 @ 8 55		

LUMBER.

CARGO PRICES OF PULPWOOD SINK.

	Retail Price.		
Rough, 3 M.....	22 50	Rough, 3 M.....	22 50
Fencing, 3 M.....	22 50	Fencing, 3 M.....	22 50
Flooring and Step, 3 M.....	22 50	Flooring and Step, 3 M.....	22 50
Flooring, 3 M.....	22 50	Flooring, 3 M.....	22 50
Rough clear refuse, 3 M.....	22 50	Rough clear refuse, 3 M.....	22 50
Rustic, 3 M.....	22 50	Rustic, 3 M.....	22 50
Rustic, refuse, 3 M.....	22 50	Rustic, refuse, 3 M.....	22 50
Surfaced refuse, 3 M.....	22 50	Surfaced refuse, 3 M.....	22 50
Flooring, refuse, 3 M.....	22 50	Flooring, refuse, 3 M.....	22 50
Flooring, 3 M.....	22 50	Flooring, 3 M.....	22 50
Rough clear refuse, 3 M.....	22 50	Rough clear refuse, 3 M.....	22 50
Beaded floor, refuse, 3 M.....	22 50	Beaded floor, refuse, 3 M.....	22 50
Half-inch Siding, 3 M.....	22 50	Half-inch Siding, 3 M.....	22 50
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The Mining Share Market.

Mining stocks, although not unusually buoyant during the week, showed an upward tendency until Thursday, when a decided break occurred in the Gold Hill stocks. The temporary panic was confined entirely to Alpe, Yellow Jacket, Imperial and Overman. The balance of the list showed little difference from previous day's sales. In the Thursday morning board when Yellow Jacket was called there was a scene of excitement. At first everybody seemed to stand firm. Bidd began to unload the stock by the thousands. McDonald, Berry, Sobmedell and scores of others threw huge lots away. The stock broke to \$38, and would have gone much lower had not Keene stood in to the rescue. Marshaling his forces about him, he tipped the wink to his brokers, and they set to work with such a will that the downward movement was checked, and the stock began to mount the ladder step by step. Over six thousand two hundred shares changed hands during the panic. Another terrible fight was made over Imperial. The price was beaten back to \$55—over 11,000 shares being started right and left. The rapid depreciation in the Gold Hill stocks came like a thunderbolt upon outside dealers, and there was great trembling lest "more mud" would have to be forthcoming.

The Trojan mining company are in trouble with their Treasurer, John W. Pearson, who, it is asserted by the stockholders, or a portion of them, has been extremely lavish with the money of the company, raised by a series of assessments, the first of which was 50 cents a share, amounting to \$50,000, and the last 60 cents a share, amounting to \$60,000. A meeting of stockholders was held this week, when they appointed a committee of three to demand a complete statement of the cost of constructing the works, and with instructions to make a full and complete investigation into the books and accounts of the company.

The dividend paid by the Northern Belle mining company is the twelfth, making a total of \$600,000, all of which has been disbursed within a year. Stockholders have received good interest for their money.

The two bonanza mines are now yielding at the rate of 10,000 tons of ore per month, producing in the aggregate about \$5,000,000 in bullion, 40 per cent of which goes to stockholders.

The new stock of the Hale & Norcross mining company is now ready. An assessment of \$1.50 per share on the new stock has just been levied, amounting to \$168,000, 100 per cent. more than need to be levied, delinquent June 21st.

The members of the Pacific Stock Exchange took possession of their fine new stock rooms this week, on Montgomery street, opposite Nevada block.

E. P. Heamer, the Secretary of the Amazon and Glasgow mines, has gone out of the city, leaving the above companies to mourn his departure for reasons of a financial nature.

The Consolidated Imperial mining company held its first annual meeting on the 13th inst. The company now control the interests formerly represented by the Beacon, Consolidated Gold Hill Quartz, Eolipse, Empire, Imperial and Trench. The trustees elected were A. K. P. Harmon, J. D. Fry, C. L. Weller, James H. Robinson, William Norris, Joseph Sharon and Alpheus Bull. Subsequently A. K. P. Harmon was chosen President; W. E. Dean, Secretary; and C. O. Batterman, Superintendent.

The stock of the Virginia gold and silver mining company has been listed on the San Francisco board.

General News Items.

JUDGE DOWLING, of New York city, is dead. The New York custom house is to be investigated.

OXFORD has finally decided not to send a crew to America.

BARNUM has been elected U. S. Senator from Connecticut.

VANDERBILT has almost entirely recovered from his late illness.

The plague is still raging with increasing virulence at Bagdad and Muscat.

PRESIDENT GRANT has refused to pardon McKee and Maguire, of crooked whisky notoriety.

HON. SAMUEL PURDY has been elected superintendent of the City Hall by the Commissioners.

OMNIBUSES are to run in opposition to our street cars on the important routes of the city; fare to be five cents.

The late floods in Maine and New Hampshire caused great loss of property, but no loss of life has been reported.

THERE are 12,000 non-paying attendants at the Centennial—exhibitors, 1,511; officials, 225; judges, 100; press, 500.

The House of Representatives have passed the bill allowing Mrs. Fitch (nee Sherman) to receive her diamonds free of duty.

The Park Commissioners, Eugene L. Sullivan, William Alvord and Louis McLane, have tendered their resignations to the Governor, to take effect at the end of the fiscal year.

The Government has decided to become a bidder at the sale of Harper's Ferry property, which is advertised to take place on the 20th of June next, at Harper's Ferry.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

California.

AMADOR.

MINING NOTES.—Amador Ledger, May 13: There is considerable activity displayed in mining matters beyond Volcano. Mac's mill is now kept running eight and a half days on rock from the claim of Irving Brothers. The small vein of very rich ore struck in the Modoc, to which we referred a few weeks ago, continues to yield up its wealth. They are now following the vein from the top of the tunnel toward the surface, and the ledge has widened from eight or 10 inches to 20 inches, so that a piece of rock can be picked from the dump that does not show free gold. We hope in a short time to be able to chronicle the result of a crush from this golden thread. Daas & Barron's mill, near Pleasant Grove, is also kept running steadily, with encouraging results.

BELDEN MINE.—This mine is situated in the northern portion of the county, and has been idle for some time. With the revival of the mining interests generally in that locality, this claim has also been brought within the stimulating influence. The Bowers Brothers and J. Ryerson have obtained control of the property, and have started running in a lively manner. After running a tunnel into the hill, they struck a quartz lead, and at last some prospecting has been done. The results obtained from the rock are very satisfactory. Encouraged by their success the boys went to work and leased the old Belden mill, in the same locality. They have crushed quite a quantity of ore, which yielded an average of \$18 per ton. To all appearance the rock is there in unlimited quantity, and it is the intention to keep the mill constantly running.

FRANK'S MINE.—Probably the richest quartz vein of its size now being worked in the county is that of Frank's mine near West Point bridge. The mill is going all the time, and every clean-up fine manages to pocket a miniature fortune. The ore is fabulously rich, some of it reaching up in the hundreds. It averages about \$30 per ton, and from this some idea may be formed of the stream of wealth which is poured into the pocket of the fortunate owner.

THE BONANZA MINE.—A correspondent at Drytown sends us the following concerning this property: The work of taking out ore has been unimpeded for the last two weeks, on account of sinking a new shaft. It is reported around Drytown that the mine will probably be sold before long. Mr. Oliver, a mining expert from the East, has been inspecting the property lately, which has given color to the rumor that it is likely to change hands. The claim has paid well so far, and the indications are that it will prove a permanent mine.

LIVELY TIMES.—Fiddletown is lively, business brisk, and the people happy. Several new buildings are in process of construction, and the mining interest is booming. Just now it is intended to bear the palm as the most prosperous camp in the county. Several claims besides those of the American Fret gravel company are being actively prosecuted, with very fair results. The company clean up every now and again, and although little is noised abroad about the amount of gold realized, yet it is generally conceded to be satisfactory.

THE MARION MINE.—Amador Dispatch, May 13: This mine, at Sutter Creek, which we have been following for some time, has been leased to Stewart & Co., and we are informed that work will be immediately resumed on the same by the lessees.

DISPUTED CLAIM.—About two years ago Robt. Fredly, familiarly known as French Bob, then living in Sutter Creek, commenced driving a tunnel into the hill close to the road, near Amador City, as it was thought close to it not far from the Keystone camp. About a month ago, however, after running into the hill a distance of about sixty feet, he was ordered to quit by the managers of the Keystone. Bob says the ledge shows between five and six feet in width, and prospects well. The reasons for the company's embargo upon the further prosecution of work we are unable to give, but, as might be expected, Bob feels bad at being compelled to sacrifice two years' toil just at the time when he thought fortune was within his grasp.

CALAVERAS.

LIVELY TIMES AT MOSQUITO.—Calaveras Chronicle, May 13: Times are said to be lively at Mosquito Gulch, consequent upon the successful working of numerous quartz mines in the district. Butting is going rapidly forward, hotels are multiplying and business all descriptions is brisk. J. L. Hoye Esq., is putting up a saloon that for elegance of finish, sumptuousness of furniture and fixtures, and beauty of surroundings, can't be beat outside of San Francisco or Mokelumne Hill. Mosquito is the liveliest camp in the mining section of the State, always excepting the boss town, of course.

STARTLING MINING NOTES.—At West Point Haskins & Hadley, proprietors of the celebrated Champion mine, are crushing in Carlton's mill. They will put about 100 tons of ore under the stamps and expect to clean-up the largest amount ever taken from a single crushing in the upper country. At Mosquito, Hadlock has 30 tons of rich ore in readiness for the stamps. A contract has been let to sink the San Bruno shaft 100 feet deeper. Champion, Dunston & Co. are the contractors. A pump is being put into the shaft, hoisting the water in buckets being found too tedious a process. The Grasshopper continues to yield unprecedentedly rich rock. The damage to Gerleard's mill caused by blowing out the cylinder head will be repaired the first of the week. Rock from several mines in the vicinity is in readiness for crushing.

THE BRADY MILL & MINE.—Saturday last we visited the Boston company's mine near Buckeye, better known, perhaps, as the Brady mine. The work of putting up the mill—one of Cooper and Cowles' Giant crushers—is about completed, it being expected to have the machinery in running order next Monday morning. Very general interest is felt in the result of its working, and should the Giant crusher realize what is claimed for it by its inventor it will greatly promote and stimulate quartz mining. The result of the operation of the mill at the Brady mine will be taken as a criterion of the merits of the new process, a fact that invests the trial with a good deal of interest among mining men. The prospects of the mine are widely favorable. The ledge, an immense one by the way, crops out boldly at the base of a mountain, obviating the necessity of sinking shafts or running tunnels in obtaining ore. Thousands of tons of quartz can be mined without penetrating the hill at all, at a merely nominal expense. The mill being situated close to the ledge the expense of transporting ore is entirely avoided. In fact, if it could be ordered, better facilities for working to advantage could not have been obtained. The rock looks and prospects well. Nearly all of it carries sulphurets, and free gold is frequently visible. Good judges are of the opinion that the entire ledge can be profitably mined.

COLUSA.

QUICKSILVER MINES.—Colusa Independent, May 13: Although Colusa county is included in the list of agri-

cultural or "cow" counties, we still have some mineral wealth. It has been said that this production of quicksilver is likely to become one of the most important industries of the State, and we do not hesitate to assert our belief that there is enough quicksilver ore in this county to supply the markets of the world for the next 10 years. We had the pleasure one day this week to visit the Last Chance, Juniper and Kentucky mines in the western part of this county. The two last named mines, though rich in ore, are not being worked at present, but the Last Chance, under the management of the Rathbun brothers, is turning out some splendid ore. This company has prospected its mine quite thoroughly, and there is no doubt but it contains an almost inexhaustible quantity of exceedingly rich ore. They have two retorts at work, but no furnaces; and we were told by Mr. Rathbun that they had turned out as much as 400 pounds of quicksilver at a single reduction. They recently assayed a new lead at the north end of the mine, and had struck a vein of black or purple powder ore, that was richer than anything hitherto found. It is literally saturated with quicksilver, and by panning it out one can almost get the pure metal.

EL DORADO.

MOUNT PLEASANT MINE.—Mountain Democrat, May 13: As many of our readers are aware, the Mount Pleasant is situated near Grizzly flat in this county. It is owned by O. D. Lambard, and Wm. Teague is the superintendent. Recently the prospecting has been done to a portion of the mine in which a rich and extensive development has been made. We are informed that this development is constantly increasing in quality and extent. Latest advices report a ledge fully eleven feet in width, of which a large proportion is very high grade ore.

A L. 49, last Wednesday, we got a glimpse at a fine full sized ledge. It had been picked up by A. J. Blakely during the preceding week at his claim on the old "Johnson ranch," some five or six miles above this city. The ledge of the nuggets weighed \$28, and there were several of half an ounce to an ounce in weight. The gold is of superior quality. On the same day Mr. Blakely sent down about 30 ounces of fine gold to the mint for assay. The gold has been taken from the ground about which Blakely and Johnson were so long in litigation, the latter claiming that there was no gold in those grass roots.

THE ROZEKREANS.—We are in receipt of highly flattering information from the Rozekrans mine, which is situated near Greenwood, in this county, and is an extension of the Taylor mine. Our information is furnished by an old friend, a miner of large experience, who has no interest direct or indirect in the mine referred to, and who could have no possible motive for misinformation. He visited that mine last week, and reports that the ledge has widened until it now ranges from seven to ten feet in thickness. In looking through several tons of ore he could scarcely find a piece which did not show free gold visible to the naked eye. The ore is heavily laden with rich sulphurets. Our friend is a practical assayer. He assayed several samples of the sulphurets which he picked up at the Rozekrans. The results ranged from \$800 to \$1,500 per ton from these same sulphurets. Our friend very confidently predicts that the Rozekrans is destined to recognition as an extraordinarily rich mining property.

THE ST. LAWRENCE.—Messrs. Alderson & Milson are making active preparations for recommencing operations at the St. Lawrence mine, near Grizzly flat. They are putting in a new six-inch pump, with which they propose to sink until they can reach the old pump which was left in the mine when the old company quit work. If, when they get down to where operations were suspended, they find that the shaft has not caved in, they will immediately proceed to sink deeper; otherwise they will be compelled to re-open it, which will of course entail some delay. The shaft was down about 800 feet, we believe, when the old company quit work. Miners who were then at work there say that at that level the north drift was in splendid ore, not very wide, but rich, and at the bottom of the shaft there was every indication that the ledge was coming in again.

MINING ENTERPRISE.—Near the mouth of Kelley canon, a short distance below Chile Bar bridge, a fine quartz property is in course of development by a company of experienced miners from Amador county. It is on a ledge which was superficially prospected many years ago by the Willets brothers. The present owners are sinking a four by eight shaft and have gone down about 40 or 50 feet, at which point the ledge is about three feet thick, between walls of granite and slate. The ore is liberally sprinkled with free gold, and the appearance of the ledge is extremely promising.

FRESNO.

NE PLUS ULTRA.—Fresno Examiner, May 13: This company has recently filed its certificate of incorporation. The principal place of business is Fresno. We understand that a portion of the capital stock will be offered for sale in order to acquire a working capital. The Ne Plus Ultra is probably the richest copper mine ever discovered in the State, and we are glad that it has at length been taken into consideration. It can be properly managed, and we shall be surprised if speedy arrangements are not made for developing the mine.

INYO.

LOCAL MINING SUMMARY.—Coso Mining News, May 13: The Lookout mines are developing to an extraordinary degree, fairly astonishing their lucky owners in the immense deposits, or rather huge veins, and the quantity and richness of the ore extracted. From C. J. Barber, the superintendent, we learn that the confidence is looking better every day. The main drift is now in 165 feet, every foot of it being run through the very best of ore. At the face of the tunnel the character of the ore has materially changed, and high grade milling ore, freely interspersed with horn silver, is now being taken out. About 20 feet from the face of the drift, the ore is now being started at the face of the drift, and through the whole distance, without a pound of waste, there being no sign yet of the hanging wall of the ore body. About 50 feet from face of drift a raise has been started and a height of 30 feet has been reached, all through the same high grade class of ore. On the Lookout a drift has been run to the right of the old one and is now in 50 feet through ore all the way, with the exception of a few boulders. At the face of drift the ore vein is 16 feet wide and all ore, two men taking out five tons per day. Assays made daily of the ore dirt run from \$160 to \$300 per ton. The new wagon road is now so near completion that wagons from Darwin run to Minute Gun spring, distant from Darwin about 10 miles and from the mines about 20 miles. The ore is excellent, and the development made within the last two or three days on the Veteran, a mine owned by Archie McDonald, on the last inst. The mine is an extension of the Confidence, the bonanza vein of the Modoc company. A splendid body of high grade ore has been developed, some 25 feet from the mouth of drift, over four feet in width, and is constantly increasing in quantity and quality as the work is prosecuted.

DEFIANCE FURNACE.

Has been running very well during the week, and the company have shipped 622 bars, there being 70 bars on hand. The foundation is now being laid and the building enlarged for the accommodation of furnace No. 2, most of the machinery for which is now here. It will probably be running within a week.

LOS ANGELES.

JUMPING.—Los Angeles Express, May 13: We learn that the claim of the Los Angeles coal company, in the San Fernando mountains, about 30 miles from here, was jumped last Sunday by a party of men who are still in possession of it. The facts, as they come to us, are these: Several months ago this company discovered cool indications in the place designated, and at once

located their claim under the United States laws. They incorporated as a company, had the land surveyed and regularly filed, and placed several men at work. The work was progressing very satisfactorily, and to a depth of 25 feet in the shaft a very superior prospect of coal was found. Last Saturday the company purchased a large amount of supplies, engaged several additional men, and started them out to the mine on Sunday. On arriving at the mine on Monday morning, they were confronted by 10 men armed to the teeth, who warned them off, and claimed the mine as theirs. As there was not force enough to cope with those who had jumped the claim, Dr. Keweenaw, who was in charge of the company's party, set the men at work sinking a new shaft near the old one. They have been at work there ever since, while the jumping party are resting on their arms, guarding the old shaft. Some of the men who are operating with the jumpers are members of the old company, and owned interests in the mine, but they with the others were there for the purpose of working the claim and holding possession for the company, and were kept in supplies while there by the company. The whole matter will doubtless be carried into the courts.

PLACER.

MINING ITEMS.—Dutch Flat Forum, May 11: Everything has been under full headway for the past week, except the usual accidents and delays incident to mining in general, and hydraulic mining in particular. The three ditches are conveying all the water desired by the miners, who are making every effort to recover the time lost by the protracted storms and deep snow. The Elmore Hill, Polar Star and Boston claims are running as contentedly as the quality of the gravel will permit. The Central, Duane, Pacific and Jehoshaphat claims continue washing.

The Yankee and Badger were washing until Saturday morning, at which time the Yankee shaft became plugged by an old drift timber, and every effort to reach below, causing the boulders to dem back, shutting down both claims for two days. The Yankee cleaned the sluices in tunnel below on Monday, refitted Tuesday, cleaned up the sluices about yesterday and resumed washing last evening. This we call quick work, as there are in all about half a mile of sluice boxes. The Franklin has been attempting to have its incline plugged Tuesday morning, about half an hour after turning on water.

AT GOLD RUN.—The Cedar, Indiana Hill, Gold Run, Sachs and Hoskin claims are washing. The two former are rapidly working down toward the bedrock, much to the gratification of the miners of their vicinity, who are anxious to see the bed of the ancient channel exposed. The Indiana Hill mine, a branch of the company, of Gold Run, cleaned up over \$5,000 a few days ago, the result of a short run.

YOU BET MINING ITEMS.—The Red Dog claim works 14 men, and is using 800 inches of water. In the Waloupa five men are employed, and 800 inches of water used. In the Nece and West 28 men are employed, and 200 inches of water used. All the above claims are under the superintendency of G. S. Powers. Regular clean-ups have been made in the above claims this season with satisfactory results. The superintendent is under full headway with a full force of men, and comes over frequently with a good showing of amalgam, the best indication in the world that his claims pay. The Chalk Bluff, under the superintendency of Dr. Keweenaw, is pushing work right along with a full force of men.

SHADY RUN ITEMS.—We learn that Capt. Anderson's claim is now paying splendidly and the prospects brightening as they advance with the work. The sluice boxes of Wedgewood, Corlett & Brink's claim were robbed on Monday, May 1st, 1876. Supposed to be the work of a couple of Chinamen, who were afterwards seen there afterwards, but no evidence to convict them was obtainable and they were allowed to depart.

SIERRA.

NEW MINING ENTERPRISE.—Mountain Messenger, May 13: The Red Dog, at Red Dog, has been mining ground between the town and the Yuba, an ancient bed of the river, and will work it with their derrick, having succeeded in lessening an abundant supply of water for all their purposes, for the next two years, of the Rock Creek ditch company. They have 20 Chinamen now at work on their diggings. All of the adjacent ground paid fabulous sums in early days, and now, when no one knows where to dig, the value of these claims should not be equally remunerative. Heretofore this ground has been divided into separate claims, and as the owners failed in coming to any agreement necessary for working the same, they remained idle. But now that they have been consolidated under an able and energetic management, great returns may be expected at the early day. The White Sulphur mine, near the dawn of another golden era for Goodyear, whose brilliant record in the historic days of '52 has seldom, if ever, been eclipsed by any California mining camp.

BU-X.—Berry is putting in new sluice boxes this week in his "graveyard" mine, which, as near as we can learn, promises good returns.

PARLIES.—Parlies have discovered good gravel diggings on the East fork above Ben Paul's saw-mill. One piece, worth \$25 or \$30, is shown, together with considerable fine gold.

SISKIYOU.

RUNNING.—Yreka Union, May 6: A. M. Johnson's quartz mill has again started up, during the week crushing rock from his ledge, and he expects to have enough water to keep it running right along.

Johnson now has some 25 men to work at the mill and, from all accounts the rock pays first-class, and this mine is considered by many to be as rich as any discovered. This property is situated on the divide between Quartz valley and Scott valley, and there are numerous other ledges around it that will also pay well when opened.

SOON RESUMED.—Work will soon be resumed at the old mine in Trinity valley. Now that the roads are opened so that provisions, etc., can be got to the mines, a large number of men will find employment there. The Alcona company have a bunch of five large retorts, already set for work, and the superintendent intends to erect two furnaces for lower class ore as soon as the weather permits. The other companies will push the work of opening their mines with increased vigor, and ere the summer is over there will be mines as rich as the Altona in hill blast.

MR. W. A. FARISH has left the Black Bear mine in charge of Mr. Johns, the new superintendent, and is looking around Siskiyou a little before starting below. The last month's clean-up at the Black Bear surpassed any other made by several thousand dollars, and it fairly made a man's mouth water to "helt" the gold brought over the mountain on Monday last. It took six Indians to peck it over the snow, and they had no very light loads then.

Nevada.

WASHOE DISTRICT.

ORIGINAL COMELOCK.—Gold Hill News, May 11: The lower tunnel is being pushed ahead with energy, and is already well started into the hill, from the ravine. Being run nearly parallel with the main vein, it must soon intersect it, after which it is proposed to follow the foot-wall, occasionally cross cutting for ore development and working. This tunnel will open the ledge to a depth of 200 feet. Meanwhile the new working on the hill has also been started to develop the ledge to a much greater depth, is making excellent progress.

SOUTH COMELOCK.—Owing to increase of water and other adverse circumstances, work is suspended in the mine until heavier machinery can be brought to bear in the case. This is being contracted for.

FRONDA.—Much difficulty is experienced in cleaning out the mine at the 400 ft level, on account of the large amount of water encountered, but the work is pushed

ahead as lively as possible, the pump doing excellent duty. A good air pipe is put in and the situation is getting pretty well under control. This water most undoubtedly comes from the main ledge or ore channel, which has not yet been fully explored, but merely cut into or tapped by the drift. The 300-ft level drift is impeded by similar trouble.

NORTH CARSON.—The erection of the new hoisting works is about completed, and they will be ready to steam up very shortly.

CROSBY CONSOLIDATED.—The north drift on the 300-ft level is now in a distance of 81 feet, and it is the intention to cross-cut and ascertain the width of the ledge when the drift has reached a point 200 feet north.

DAYTON.—Sinking the main shaft is going rapidly ahead, the bottom in good sinking ground. The east drift, on the 700-ft level, is rapidly approaching the ledge.

DAY WASHINGTON.—The repairing and easing up of the shaft timbers, necessitated by the swelling of the vein matter near the bottom, is completed, and sinking is resumed at the rate of nearly four feet per day. Splendid ore indications are being passed through, with no increase of water.

MINT.—The shaft is now down 1,080 feet, the bottom again in soft ledge material. The flow of water is still light.

CONSOLIDATED VIRGINIA.—Daily yield, 600 tons of ore. The ore breasts are both looking and yielding well. The ore shows no depreciation in value, and the prospects of the mine appear to be as good as they have at any time during the past year. The usual monthly dividend of \$2 per share, aggregating \$1,080,000, was paid on the 4th inst., and a surplus carried over sufficient to make another such, if the management so desired. The east drift on the 1500-ft level is now well advanced toward the C. & C. shaft, which is now down almost to the point at which it is the intention to open a station to connect with the drift. The most important feature in connection with the mine for the past week, however, has been the starting up the north drift on the 1700-ft level of the Best & Belcher mine, to cut and prospect the Consolidated Virginia ore vein. This drift will cut the ledge at a depth of nearly 200 feet below the present workings, and will penetrate nearly 100 feet lower down than the bottom of the winzes sunk below the 1550-ft level of the Consolidated Virginia and the California. The developments to be made by this drift will be looked forward to with deep interest by every person having or taking an interest in the Comstock lode. The erection of the new Consolidated Virginia amalgamating mill, and the new 80-stamp mill east of the C. & C. shaft, is going rapidly forward. The foundation timbers are being framed, and much of the machinery for each is already on the ground.

CALIFORNIA.—Daily yield, 360 tons of ore, keeping the California and Sacramento mills steadily running. The ore breasts were never showing richer than at present. Laying the foundation sills for opening out more extensively on the ore body is going rapidly forward. The first dividend of this mine—\$2 per share, aggregating \$1,080,000—was declared on the 8th, payable on the 15th inst. This is but the beginning of millions of dollars that the mine is to yield for the next two or three years to come, which will place the California side by side with her twin sister, the rich and prolific Consolidated Virginia. Had the company the mills with which to crush their ore, no effort whatever would be required to take out and mill ore sufficient to produce \$3,000,000 per month. The north winze, below cross-cut No. 6, has reached the 1600-ft level, at which point a drift is being run to connect with the Ophir shaft for ventilation purposes. On the 1400-ft level the north drift is being steadily pushed ahead to connect with the Ophir. Sinking the C. & C. shaft is making fair progress notwithstanding the strong, steady flow of water at the bottom.

OPHIR.—Daily yield, 150 tons of ore, keeping the Winfield, Empire State and Nevada mills all steadily running. The ore breasts on the 1600-ft level going steadily toward the California line are yielding rich ore. The stopes at that point have about 140 feet to be cut yet to reach the line. The north drift on that level running toward the Mexican ground is making excellent progress. The blasting in this drift is being done by means of Burleigh drills. On the 1700-ft level the north drift is also being advanced to cut the ore vein at a point under where the fine ore discovery was made in the Mexican lode on the 1455-ft level. The main southeast drift on the 1100-ft level is steadily advancing, the face still in quartz of a good description. The upraise from the 1300-ft level is in ore, and is making good progress. The fourth compartment of the main shaft is completed down to the 1600-ft level. The new office building is ready for occupancy, and everything in and about the mine is in excellent working condition.

NORTH CON. VIRGINIA.—The shaft has reached a depth of 800 feet, at which point the sinking has been suspended for the purpose of cutting out a station and putting in a large water tank. It was decided that the shaft had reached a depth at which it was necessary to put in pumping machinery that will drain any sudden heavy flow of water that may be encountered. This is a good move in the right direction, for should a strong body of water be struck the present appliances would never suffice to keep it down. The plans and specifications for the new shaft have already been forwarded, and the machinery will be manufactured in San Francisco and forwarded at the very earliest possible moment.

PHIL SHERIDAN.—The new machinery is all in place and working splendidly. It is sufficiently powerful to sink the shaft with ease to a depth of 1,200 feet or more. The shaft is now being put in good working condition, and in a very few days the water, of which there is about 30 feet in the bottom of the shaft, will be drained.

JULIA.—The south drift on the 1600-ft level is developing a better character of quartz and ore every day as it progresses farther to the southward.

OROVN POINT.—The ore vein on the 1600-ft level has been thoroughly prospected to the Belcher line, without finding any paying bodies of ore. A drift is now being run east on that level, near the center of the drift, with the view of fully determining whether there is any split or division of the vein in that direction.

BROOKS.—Rapid progress is being made in sinking the main shaft. The ledge material at the bottom is very favorable. As soon as the shaft has reached a depth of 200 feet a cross drift will be run to ascertain the width of the ledge.

JUSTICE.—Sinking the main incline below the 1000-ft level is going steadily forward, the bottom in good working ground. The north drift on the 800-ft level is now being advanced, and the prospects that have been found north of the shaft since the discovery of the rich streak of ore found north on the 300-ft level. A cross-cut east has been started from this drift which also has some excellent ore prospects.

GLASGOW.—On the 300-ft level the main north drift has penetrated a body of ore 20 feet, the entire face of the drift being in ore of a good quality. The ore seems to be mainly sandstone and quartz, and the indications are that the drift has cut the apex of a large chimney of ore. A winze will soon be started to test the ore vein below this 300-ft level.

WARD.—Sinking the shaft is making excellent headway, the bottom in good working ground. It is now down 90 feet. Occasional seams of quartz are encountered, and the drift is being advanced yesterday a streak of quartz 18 inches thick, which gave an assay of \$28 per ton, was struck in the shaft.

AMAZON CON.—The ore developments so far on the 300-ft level are very encouraging. It is intention to shortly commence the sinking of the main shaft for the purpose of opening a new level.

CRAN.—The usual amount of good ore is being extracted from the stopes on the tunnel level. The

drift north on the 300-ft level is in good ore. The water in the main incline is rapidly receding.

OVERMAN.—The upper or 900-ft level has been opened and about 30 tons of ore per day is now being extracted from the ore body struck in that portion of the mine a year ago or more.

GOUIN & CURRY.—The foundations for the pumping machinery are being pressed to completion with all possible vigor. The old carpenter shop on the south side of the shaft is being removed, to make a sufficiency of room.

BULLION.—The drift on the 2000-ft level is steadily advancing, the rock in the face gradually softening and showing signs of a nearer approach to the ledge.

SUPERIOR.—The flow of water is quite strong, and is steadily on the increase. New machinery has been contracted for, and it is expected will be on the ground ready for use by the first of next month.

CHOLLAR-POWELL.—Daily yield 90 tons of ore, the assay value of which is \$33 per ton. Sinking the main incline below the 1350-ft level is progressing at the rate of two feet per day.

PROSPECT.—Twenty feet has been added to the depth of the shaft this week. The depth is now, 220 feet. Another Ingersoll drill will arrive from New York in a day or two and be put to work in the shaft.

YELLOW JACKET.—Sinking the north winze below the 1940-ft level has been resumed. Cross-cuts Nos. 3 and 4, on the 1040-ft level, are showing good prospects. The north and south drifts in the ledge on the same level are also looking more favorable.

EXPRESS.—The north drift on the 2000-ft level still continues in good ore. A chamber has been cut out and a winze started downward on the ore vein near the north line. The ore in the bottom of this winze is still showing rich ore.

BELCHER.—Daily yield, 450 tons of ore. The ore breasts are all looking well and yielding the usual quantities of good milling ore. The foundations for the new pumping machinery are rapidly approaching completion.

UTAH.—The flow of water at the bottom of the main shaft is strong, but can yet be readily handled with the pumps.

SILVER HILL.—A new station is being opened at the 500-ft level of the incline. While opening the station it has been found necessary to suspend the sinking of the main incline.

WEST BELCHER.—The west drift at the 226-ft station is in 240 feet. The northwest drift on the same level is in 138 feet. The faces of both drifts are still in low grade ore.

HALE & NORCROSS.—The work on the foundations for the new pumping machinery is going steadily forward. The machinery is arriving on the ground daily.

EAST OVERMAN.—The shaft is in good working ground and is cutting stringers of quartz that give valuable assays.

PICTON.—Branches and streaks of pretty fair ore have been cut through by the drift this week, showing that something good may be expected when cross-cutting through the ledge.

CEMOPOLITAN.—The raise above the main adit tunnel was up 144 feet last evening, following the inclination of the ledge in good ore.

ROCK ISLAND.—The north drift on the 850-ft level is showing a very encouraging improvement; also the west drift on the same level.

TROJAN.—The new hoisting works and machinery are all completed and ready to start up as soon as a mud drum for one of the boilers arrives.

KOSSTER.—The water is reduced to below the 350-ft level. The drifts on that level were but little damaged by the water.

SUCOR.—Sinking the main shaft is going ahead steadily. The flow of water is still strong.

LANT BAYAN.—The foundations for the new machinery are being laid as rapidly as possible.

UNION CONSOLIDATED.—The quartz in the face of the north drift on the 1300-ft level is still showing finely.

ALTA.—Laying the foundations for the new and powerful pumping machinery is making excellent progress.

REN & WHITE CROSS.—Negotiating for new hoisting works for deeper sinking.

(Continued on Page 332.)

Steamboat Sulphur Beds.

A week or two since a reporter of the Gold Hill News visited the recently discovered sulphur beds, situated at the base of the mountain, one and one-half miles west of Steamboat springs, in Washoe county, and from a personal inspection of the mines and surrounding country, is enabled to give the following facts and conclusions: The sulphur belt was discovered a few months since by Thomas Wheeler and Isaac Spencer, of Reno, who were prospecting in that section for cinnabar. The deposits have been opened by cuts and shafts at different points, extending north and south for a distance of half a mile or more. The sulphur is imbedded in a light colored, chalky appearing formation, strongly resembling slate, which formation is half a mile in width, and can be traced northerly and southerly for at least a mile, and, judging from the general surface appearances, it is reasonable to suppose underlies the whole extent of the magnesium formation. The sulphur has been found in most of the shafts and cut a very few feet below the surface. On the surface no escapes or indications of heat are visible, but in all the cuts and shafts great heat, steam and gas have been developed a very few feet below the crust. The principal claim, known as the Wheeler & Spencer, has been leased to James Duffly and Thomas Smith of Carson City, for a term of three months. These gentlemen have commenced the opening of the sulphur deposit on a point of the mountain, some 150 feet above the level of the flat, having secured for a foreman of the works the services of Mr. Joseph Scott, who is probably the best posted sulphur miner and prospector in the State. Mr. Scott opened the famous Rabbit Hole mine in Humboldt county, and has been a steady prospector in that line for several years past. The mine at that point has been opened to a depth of 20 feet by running open cuts into the hillside wide enough in which to turn a horse and cart. The cuts show the sulphur to lie in crystallized bunches and streaks, intermixed through and through the talc, or magnesian bed. Five or six tons of sulphur had been extracted, and lay piled up ready for shipment, and some fifty tons more were stripped, almost ready for extraction. At the bottom of the pit the heat was great enough to ruin the soles of a man's boots who would dare to linger there any length of time, and the sulphurous gases and steam made it a very uncomfortable place in which to labor. The appearances show, beyond a doubt, that a large and paying deposit of sulphur has been found. The sulphur, in its raw state, just as it is extracted from the mine, assays about 75 per

cent. of the pure article, and is worth in the San Francisco market \$50 per ton. These beds are within easy reach of the railroad, and if it is desirable a side track can be easily constructed almost to the mines.

These hot, steaming beds of brimstone undoubtedly furnish a natural clue to the causes that operate the famous Steamboat springs, a mile and a half to the eastward. The formation underlying the sulphur beds is undoubtedly an immense ledge of magnesian limestone, filled with veins of iron, sulphur, and other minerals. Immediately in front, and overlying this bed of minerals, is a mountain of hard, syenitic granite. Back of it the mountain rises quite abruptly, and there is but little doubt that some of the small lakes formed by the melting snows on the table lands above find outlets through the open rocks into this bed, thus producing a decomposition of the minerals and releasing the carbonic acid in the limestone, which creates the powerful heat of the springs. The minerals are thus sublimated, and afterwards condensed by the cold near the surface and left in the state in which we now find them. The first dip of the stratum, at the base of the mountain, is quite steep, and the flow of water following the strong inclination of the rocks evidently passes underneath the belt of syenitic granite in front, and finds an outlet through the fissures and seams in the soft rocks beyond. The damming or closing up at times of these escape valves no doubt often confines the sublimated minerals and superheated steam to such an extent that it is forced to the surface with great power, which readily accounts for the mysterious exudation of the sediment and water which so often takes place so forcibly, and has attracted so much attention from visitors.

Tuolumne County Mining Interests.

Of late years but little attention has been paid to quartz mines in our county, and yet they are destined to become famous, and that at no distant day. We can look back and see where, in different locations, hundreds of thousands have been squandered recklessly and foolishly. Mines which under careful and judicious management would have yielded splendid returns to the shareholders are now abandoned. But a new era is dawning upon us. Already we discern signs of regeneration. The different processes which we have from time to time brought before our readers are gradually assuming definite shape. We hear of the Fryer process soon to be in operation at the Waters claim, and the Lightning amalgamator (patented by Walker & Co., of Philadelphia) will shortly be on a mine in the immediate vicinity.

At the Consolidated Alabama mine, Cowles & Cooper's Giant mill is in active operation, and bids fair to surpass all other mills in the reduction of ore. Inexpensive as it is, and effectual in its working, there can be no doubt but that it will be adopted by a great many of the mines which have been unable to work to a profit with the old stamp mills. At this mine, which is justly attracting considerable notice, there has just been completed one of Schofield's concentrators, which is far ahead of anything of the kind now in use. It needs no prophetic eye to facilitate an early commencement of dividends to the shareholders.

A short distance from the above, the mines owned by Messrs. Hayward and Rosbury are situated, and it is probable that they will soon begin operations on a large scale.

The Raw Hide, adjoining the Alabama on the northwest, one of the most celebrated in the State, lies idle. Half a million has been spent here, but through the folly and reckless disregard of the superintendents and others in charge, the managers were reluctantly compelled to cease all operations. It is expected that they will soon start again with one or another of the new processes, and it cannot but prove largely remunerative to the owners.

We may be in error, but we predict that within the next twelve months the different mines lying between Quartz mountain and Carson hill will attract more attention from capitalists and speculators than any other mining section in our State.—Tuolumne Independent.

THE PENRYN QUARRIES.—We paid a hurried visit to the Penryn granite quarries, and were pleased to note the progress that had been made in a short time. A large force of men are engaged in getting out and dressing the stone for the new Stock Exchange building in San Francisco. Massive blocks and pillars of granite cover the ground, and over a hundred men are constantly adding to the amount. The polishing works are in full operation, and the workmen were engaged in setting up several fine monuments that had been just completed. Several fine large pillars for the Exchange building have to be polished, and an immense lathe for this and similar work is now almost ready for use. Altogether, over 150 men are employed about the works, and more are constantly being employed. The presence of such a number of men, all employed in profitable labor, gives Penryn a prosperous air, and as they are all white men, the effect upon business is quite appreciable. Mr. Griffith makes no noise about it, but he is a far more practical opponent to Chinese immigration than many who take occasion to say a great deal. No Chinamen are employed about his extensive works; and this is no spasm of virtue, to work off as soon as the excitement dies away, but has been his uniform practice ever since he opened his quarries.—Placer Argus.

Little York Mining Items.

All the claims in this district that are now being worked, says the Dutch Flat Forum, are owned by the Little York gold washing and water company—an English corporation. H. A. Hagadorn is the superintendent. Generally speaking, the claims so far this season are looking more encouraging than ever before, and the prospects for a good summer's work are flattering.

The Empire claim, located in and adjoining Little York, contains 250 acres of ground, with an average gravel bed of about 70 feet, through which the blue lead channel runs, which, of course, is the richest part of the claim. The claim is worked through a bedrock tunnel 1,440 feet long, which empties into Steep hollow. They use 1,400 inches of water with 235 feet pressure, the water being taken from their own ditch through a pipe 1,000 feet long, which is four and one-half feet at the sand tank, tapering down to 22 inches, and run through two giants with six inch nozzles. Twenty-five white men are employed on this claim (the superintendent does not think it economy to have Chinamen), who are kept constantly employed. This claim has been running since April 1st, and will continue until June 1st before they clean up. Tom Bailey, an experienced and practical miner, is the foreman. An instrument called a deflector is used on the mouth of the nozzle in the claim, which, we think, will prove to be a great labor-saving invention. It is arranged in such a manner that the water from the nozzle moves the giant, and the lever that moves the deflector can be handled by a ten-year-old boy.

The Christmas Hill claim comprises 145 acres of land, with an average gravel-bed of 90 feet. Twenty men are kept at work here. Here they use 800 inches of water, through a pipe 9,000 feet long. They have made four clean-ups this season, every one of which paid a dividend. Mack Eubright is the foreman of the claim.

The Conocil claim, owned by the same company, is run by Chapman & Tibbets. They have made several very satisfactory clean-ups this season. We promised these gentlemen to call over some day and see them, when we may be enabled to get a better idea of what they are doing.

The Liberty Hill claim is also owned by the same company. Here they use 1,400 inches of water, and run right along with a full force of men. From past and present indications it is expected that this claim will prove to be the big bonanza of the Nevada county side of Bear river.

Groom District.

We are sorry to see by the following extract from the Pioche Journal that affairs at Groom district are not progressing favorably:

From William Wescoat, who returned yesterday from Groom district, a mining camp situated about 120 miles southeast from Pioche, and in Lincoln county, we obtain the following particulars concerning that place. The Groom company's mine, the principal one in the district, is at present lying idle, in consequence of an injunction put on the mine by Mr. Osborne, who claims to be sole owner, and that there never was such a corporation as the Groom company. He still holds possession of the mine and mill. Such is the present situation of that camp. There are some dozen miners living in the district, all doing little or nothing. The large saw mill recently erected on Timber mountain by the Groom company, was on last Friday blown down by a heavy gust of wind. The damage done was considerable, and on account of the discouraging state of affairs, nothing will be done towards repairing the wrecked building. Considerable damage was done to the company's mill, and several houses were unroofed and blown down during the storm. Mr. Wescoat thinks the present condition of that section demoralized beyond all redemption, and unless some steps are soon taken to properly arrange the difficulties among the owners and alleged owners of the mines, the place will soon be defunct.

UNIONVILLE ITEMS.—A correspondent of the Silver State writes that a decided change for the better is apparent in Unionville. Times are getting lively and more money in circulation. Everybody who cares to work and is able to do so can find employment. The Arizona mills are in full blast and turning out bullion daily. There is quite a large number of men at work in the Arizona mine, which is producing sufficient ore to run the mills, and some rich enough to ship away. The placer mines south of town furnish employment for a good many men. In Spring canon, Sam Pooley and partner took out last Friday \$64 in dust, and on Saturday the same two cleaned up \$54. In Cottonwood the diggings are looking very favorably. These diggings are far richer and more extensive than the much talked of Black Hills are proving to be, yet it would not be advisable for a great many persons to rush there, as the supply of water is limited.

The ore from the Consolidated Virginia is wet down as it is deposited in the ore house, to save the dust, which is fine chloride of silver and valuable; and in the California mine the ore is sprinkled in the breasts, with the same object. It is made so wet that there is no danger of its being blown away before it reaches the mills.

USEFUL INFORMATION.

Belts, Pulleys and Screws.

The following hints on belts, pulleys and screws contain facts worth remembering: To find where to cut belt holes in floors: Measure the distance in inches from center of driving shaft to under side of floor; on the upper side make a mark over the center of shaft. Now measure the distance from center of shaft on masonry to be driven to floor, making a mark on the floor immediately beneath the center; then measure the distance between the two marks. Transfer these figures to a board or paper, draw off the driving and driven pulleys, after finding their diameters at the distance from each other and the floor line previously obtained, and draw the lines representing the belt cutting the floor line, which will show where the belt passes through the floor. The drawings can be made to a scale to reduce it to convenient dimensions, maintaining the proportions. The holes may now be marked off on the floor and cut with a certainty of being correct. In making the drawing it is best to do it full size on the floor, if room can be had, and allowance must be made for the thickness of the flooring. When a system of pulleys or blocks is operated by a single rope, the charge which can be sustained by the lower block is equal to the weight applied to the end of the rope multiplied with the number of ropes supporting the block. Thus, when the upper and lower blocks possess one pulley each, the load will be supported by a twofold rope; for two pulleys, by a fourfold rope; and, therefore, in the first case every pound on the end of the rope will support two, and in the second case, four pounds on the blocks. The pressure obtained by a screw is found by multiplying the force applied to the lever and twice its length, and with the number 3.1416, and dividing the product by the distance of the screw threads. This rule is founded on the facts, first, that a screw is nothing but a curved inclined plane, of which the circumference is the length, and the distance of the threads the height; and second, that the force is applied by a long lever outside the screw, and moves around the screw at a distance equal to the length of the lever, in a circle to which the diameter is equal to twice the circle or radius, and the circumference equal to twice the radius multiplied by 3.1416. It is also observed here that for every total revolution of the screw it descends as much as the distance of the threads, while the force applied moves through a distance of several feet in the large circle at the end of the lever.

Hints for Practice.

The following compound is said greatly to facilitate the washing of clothes. Dissolve two pounds of bar soap in about three gallons of water as hot as the hand can bear. Add one tablespoonful of turpentine, and three of liquid ammonia. Stir, and steep the clothes in this for three hours, keeping the vessel tightly covered. Then wash the clothes in the usual way. The soap and water may be used a second time, in which case a teaspoonful of turpentine and the same amount of ammonia must be added. This treatment is calculated to save much labor in cleansing summer clothes stained by fruit, etc.

To prepare skins for fur, mix bran and soft water sufficient to cover the skins. Immerse the latter and keep them covered for 24 hours; then remove, wash clean, and carefully scrape off all flesh. To one gallon of water (hot) add one pound of alum and one-fourth pound of salt. When dissolved and cool enough to admit entrance of the hand, immerse the skins for 24 hours, dry in the shade, and rub. Stir the liquor again, immerse the skins for 24 hours, dry, and rub as before, immerse for 24 hours in oatmeal and warm water, partially dry in the shade, and finally rub until entirely dry. This leaves the skin like white leather, and fit for immediate use.

A new and simple blowpipe consists of two large jars connected near the bottom by a piece of rubber tubing. One is filled with water and put on a shelf above the table on which the other stands. The water passes into the latter, and, in doing so, forces the air out through a stopper and piece of tubing into the blowpipe, which is supported separately. With jars of one gallon capacity and an orifice of 0.016 inch, a steady air current of ten minutes' duration is obtained; and to keep it up, one has merely to transpose the jars.

Grease can be removed from billiard or other cloths by a paste of fuller's earth and turpentine. This should be rubbed upon the fabric until the turpentine has evaporated and a white powder remains. The latter can be brushed off, when the grease will have disappeared.

Gold can be applied to glass by mixing it in a powdered state with mucilage and adding a little borax, so that a paste is formed. Having been painted with this compound, the article is heated in an oven. This burns the gum, while the borax vitrifies and so fixes the gold.

A compound of grease and zinc filings is found to be an excellent preventive against rust for iron bolts inserted in wood. It is used to line the bolt hole.

A weak solution of cyanide of potassium cleans gold lace well.

HOW TO CALCEMINE.—Buy the best bleached glue (if dark it is immaterial so the glue is clean), and use it in the proportion of a quarter of a pound to eight pounds of whitening. Soak the glue over night; in the morning pour off the water, as it simply swells while soaking. Add fresh water and put it in a pail, and set that in a kettle of boiling water. When dissolved, stir it into the water, adding enough water to make it, after mixing, of the same consistency as common whitewash. It may be tinted any color, and applied with a whitewash brush. If the color is rubbed smooth in a little water and then mixed with the wash it will be more even. If the walls have been previously whitewashed, scrape away all that will come off, and wash with a solution of white vitriol—two ounces in a pail of water. The vitriol will be decomposed, forming zinc white and plaster of paris, to which calcimine easily adheres. It is important to dissolve the glue in a hot water bath, for if scorched by too great heat its tenacity is impaired or destroyed. Whitening is simply chalk freed from impurities and reduced to a fine powder, and is also known under the name of Paris and Spanish white, though the latter is really a white earth found in Spain. There is a great difference in whitewash brushes, and the beauty of the work, as well as the ease of performing it, depends very much on a good brush, making it well worth while to pay the difference between that and a cheap one. For the inexperienced it is more difficult to lay on tints evenly than pure white.

SPIRITS OF AMMONIA.—"A Farmer's Wife" writes an Eastern journal as follows: There is no telling what a thing will do till you try it. I knew ammonia, diluted in water, could restore rusty silks and clean coat collars, but when I got a green spot on the carpet, I tried half a dozen other things before I thought of that, and that is just what did the work effectively. I put a teaspoonful into about a teacupful of hot water, took a cloth and wet the spot thoroughly, just rubbing it slightly, and the ugly spot was gone. It is splendid for cleaning your silver; it makes things as bright as new without any expenditure of strength; and for looking glasses and windows it is best of all; and one day when I was tired and my dish cloths looked rather gray, I turned a few drops of ammonia into the water and rubbed them out, and I found it acted like a charm, and I shall be sure to do so again some day. I suppose housewives have a perfect right to experiment and see what results they can produce; and if they are not on as large a scale as the farmers try, they are just as important to us, and may make our work lighter and brighter too. Now, I do not believe in luxuriating in a good thing all alone, and I hope all the housekeepers will send and get a ten cent bottle of spirits of ammonia and commence a series of chemical experiments and see what they can accomplish with it. Take the boys' jackets, the girls' dresses, and when you have cleaned everything else, put a few drops in some soft water and wash the little folks' heads, and report progress.

ARTIFICIAL MEERSCHAUM, HORN AND CORAL.—A new way has been found of making excellent imitations of meerscham, horn and coral out of potatoes and carrots. To make the falso meerscham, the potatoes are peeled and macerated for 36 hours in water acidulated with eight per cent. sulphuric acid. They are then dried on blotting paper, and in hot sand under pressure upon plates of chalk or plaster for several days. The chalk supporting the plates must be renewed daily. The resulting material can be readily carved. If greater durability, whiteness and elasticity be desired, the potatoes are macerated in water containing three per cent. of soda instead of the acid above mentioned. To produce the horn imitation, the potatoes, after being treated as last stated, are boiled in water containing 19 per cent. of soda. By substituting carrots for potatoes, a good imitation coral is produced.

WINDOW ORNAMENTATION.—Glass may be made extremely ornamental in several ways, a few of which I will now describe, as perhaps some of our readers may not have heard of them: First cut out various figures from thin white muslin, Swiss, tarlatan, or even tissue paper; stars, circles, rings, diamonds and squares of different sizes are among the best. Make some nice mucilage of gum arabic and paste them on the panes, making narrow lines, connecting them with strips of the material. Arrange all in tasteful designs, and over this give a coat of clear demar varnish.

In the Savage mine the deep foundations for the immense pumping machinery now in course of construction are being laid as fast as the workmen can accomplish the task. The old incline machinery is being removed and new foundations are being laid for the erection of an engine, to be used in hoisting and lowering the pumping machinery in the shaft. Everything is being done that is possible, to complete the improvements now being made at a very early day.

SINKING the new shaft of the Tahoe mine was suspended some days ago, a contract having been entered into between the Tahoe and Lady Bryan for the sinking of a large working shaft on the south line of the Lady Bryan. In consideration for so doing, the Lady Bryan is to have the use of one-third of the shaft, for which they are to pay one-third of the cost. The new shaft has been started.

GOOD HEALTH.

Pulmonary Consumption in Cities.

A tenth of the people of the cities die of consumption. For its prevention, hygienic treatment is the most successful. By drainage the mortality is greatly reduced. An elastic, dry atmosphere is best. Few of the large cities have a mild and equable climate favorable to the respiratory organs, the want of which develops pulmonary complaints. Of the rich, 60 in 1,000 are afflicted with this disease, and 223 to the thousand of the poor. Among the children of the aged and diseased it is more frequently found. When darkness and dampness prevent growth and health, consumption is produced.

The quantity of oxygen is always diminished in cities, even in the streets. Persons predisposed to consumption ought not to be allowed to live in cities. The absence of sunlight is a fruitful cause of the prevalence of the disease. It is not permitted in our houses, and when it does pretend to intrude, our housewives exclude it with heavy curtains. The streets are so narrow and the houses so high that sunlight seldom reaches the sitting-rooms. The school houses are so situated that children can scarcely ever see the sun.

The sun is the source of all light, life and beauty, and is as necessary to give color and health and life to animals as to plants. It corrects musty smells, so prolific of disease. There is no surer way of promoting consumption than by the exclusion of sunlight. Sedentary life and inactivity, impure air and the absence of sunlight in cities produce a fearful mortality from consumption. No exciting cause is so general as in-door occupations.

Excessive dryness, especially in the houses of the rich, is bad for health. Many other influences of city life contribute to its prevalence. Proper food is next in importance to pure air in preventing a development of the disease. To the neglect of supplying to all an abundance of milk and butter is largely attributable the increase and prevalence of the disease. The poor, especially, get but little hydro-carbonaceous food, and with the rich it is not the favorite it ought to be. Close confinement to business, overwork and whatever contributes to impair the vigor of the body tends to develop consumption. The hygienic treatment of all diseases is the great medical fact of the times.

—Professor Frank Donaldson.

Treatment of Burns and Scalds.

At the Graetz medical congress, Dr. Nitzsche, who is surgeon to several factories in Austria, stated that he had noticed that the workmen who met with burns obtain much relief from the application of varnish. This forms a protective covering in the absence of epidermis, and granulation and cicatrization are favored. Dr. Nitzsche thought he could improve upon this, and tried to keep away Pasteur's germs by adding first catholic acid, and subsequently salicylic acid, to the varnish. He considers that he thus succeeded in many cases in effecting prompt healing. These burns were probably in the third degree, with complete loss of epidermis. Another kind of burn, where the epidermis is preserved, but much serum is secreted underneath, has fixed the attention of Dr. Marin, of Geneva. This physician grounds his treatment upon Dutrochet's law of exosmosis, and thinks that the diminution of the serum effused under the epidermis should be obtained without the destruction of the latter. This is effected by the application of thick fruit jellies, say of quince, raspberries, etc. Compresses of lint should be soaked in the jelly, so as to become considerably thickened. The serum transudes into the compress, and when after a day or two it is removed, the epidermis is found shrivelled up, and the parts beneath protected from inflammation and ulceration. Dr. Marin insists upon the rule that when pieces of clothing are adherent to the burned surface, they should not be removed, for fear of dragging the epidermis with them. The compress should be placed on the clothing material, and the exosmosis will eventually go on just as well. Dr. Marin quotes, in a pamphlet on the subject, several cases well calculated to recommend this kind of treatment, concerning which he is very enthusiastic. It is well known that a long time ago jams and syrups were used in France, empirically, in cases of burns. Louis XIV having met with a burn on his hand, his valet de chambre plunged it immediately into a jar of jam with much relief.

HOW WE TAKE COLD.—It is one of the facts best known to science that, when a part of the outer surface of the body has been exposed long to cold, the greatest risk is run in trying suddenly to re-induce warmth. To become thoroughly chilled and then to pass into a very warm atmosphere, such as is found near a fire, results in a dangerous reaction which, a few hours later, may cause pneumonia or bronchitis, or both diseases. The capillaries of the lungs become engorged, and the circulation becomes static, so that there must be a reaction of heat inflammation before recovery can occur. Common colds, says a contemporary, are taken in the same way: the exposed mucous surfaces of the nose and throat are subjected to a chill, then they are subjected to heat; then there follows congestion, reaction of heat, pouring out of fluid matter, and the other local phenomena of catarrh.

THE ECONOMY OF VEGETARIANISM.—A writer in the *Quarterly Journal of Science* makes a trenchant criticism of the arguments usually employed by vegetarians in support of their system of diet. The author considers the question from the economic, the moral and the hygienic points of view, but we have not space to give more than an epitome of his remarks on the first of these topics. One hundred acres of good land, say the vegetarians, will support a greater amount of human life, if planted with wheat, potatoes and other crops directly consumed by man, than if laid out in pasture or set with vegetables intended for the food of cattle. This is true, but all lands are not good; in every country there is abundance of land that is unfit for tillage, and which, nevertheless, yields excellent pasture. Under a vegetarian regime such lands would cease to supply the food market. So, too, the produce of the forest and moor—game—would cease. More serious still, the waters would no longer contribute their share. It might be said that poor lands could still be used for pasture, and the produce of flocks and herds (wool, butter, cheese, milk) utilized. But if the grazier cannot sell the meat, it would be unprofitable to keep animals, unless he could get for the products above named prices a hundred-fold higher than he gets now. Besides, the use of milk, butter and cheese is inconsistent with vegetarian principles. In a strictly vegetarian country, tallow, hides and hair could scarcely be procured. Again, the refuse of the fisheries is rising into importance as a manure fully equal to Peruvian guano. But if fish might no longer be captured, the supply of this fertilizer would be cut off, unless indeed the destruction of animal life for purposes other than food received an exceptional sanction. Even then the cost of raw material would be greatly enhanced.

DOMESTIC ECONOMY.

Nutritive Value of Corn.

Indian corn is one of the most important and healthful articles of human food that a beneficent Providence has bestowed upon man; and to its high nutritive value is due in a large degree the strength and vigor of the race of men who laid the foundation of this great republic. It was much more largely used 50 or 100 years ago than now, as fine wheat flour, for some not well founded reason, has usurped its place in bread making. In the several forms, however, of hulled corn, popped corn, hominy, samp, corn starch, maizeana, etc., vast quantities are consumed by all classes of people.

Meal from Indian corn contains more than four times as much oleaginous matter as wheat flour, more starch, and nearly as much nitrogenous material; consequently in all cold climates it is admirably adapted to sustain the system by furnishing heat-forming compounds. The oil gives warmth, the nitrogenous principle gives muscular strength. The combination of alimentary compounds in Indian corn renders it alone the mixed diet capable of sustaining man under the most extraordinary circumstances. It holds the elementary principles which constitute the basis of organic life. In this particular it is more remarkable than any other vegetable production known to man. There is a large number of dishes of which corn meal forms the basis, which are exceedingly palatable. What, for instance, is more delicious than cold corn pudding out in slices and fried in sweet butter and lard? Hot corn cakes, when properly and skillfully made, are almost invariably regarded as a luxury, and Boston brown bread is famous everywhere in the country. —*Journal of Chemistry.*

Household Hints.

To whiten flannel made yellow by age, dissolve one and a half pounds of white soap in 50 pounds soft water, and also two-thirds of an ounce spirits of ammonia. Immerse the flannel, stir well around for a short time and wash in pure water. When black or navy blue linens are washed soap should not be used. Take instead two potatoes grated into tepid soft water (after having them washed and peeled), into which a teaspoonful of ammonia has been put. Wash the linens in this and rinse them in cold blue water. They will need no starch, and should be dried and ironed on the wrong side. An infusion of hay will keep the natural color in buff linens, and an infusion of bran will do the same for brown linens and prints.

If brooms are wet in boiling sands once a week they will become very tough, will not sweep like a new broom. A handful or so of salt sprinkled on the carpet will carry the dust along with it and make the carpet look bright and clean. A very dusty carpet may be cleaned by setting a pail of cold water out by the door, wet the broom in it, knock it to get off all the drops, sweep a yard or so, then wash the broom as before and sweep again, being careful to shake all the drops off the broom and not sweep far at a time. If done with care it will clean a carpet very nicely; and you will be surprised at the quantity of dirt in the water. The water may need changing once or twice if the carpet is very dirty. Snow sprinkled over a carpet and swept off before it has time to melt and dissolve is also nice for renovating a soiled carpet. Moistened Indian meal is used with good effect by some housekeepers. The broom wears out carpets as much as feet do.



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DEWEY & CO., Publishers.

A. T. DEWEY, GEO. H. STROMO
W. B. EWER, JNO. L. BOONE

Office, No. 224 Sansome St., S. E. Corner
of California St., San Francisco.

Subscription and Advertising Rates:

ADVERTISING RATES.—1 week, 1 month, 3 months, 1 year.
Per line.....25 .80 \$2.00 \$5.00
One-half inch.....\$1.00 3.00 7.50 24.00
One inch.....1.50 4.00 12.00 40.00

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We wish to thank those subscribers who send in their renewals to the Press promptly as regularly as this year comes round. It saves us much expense in commissions for collections and renewals. May we not request more of our good patrons to do so!

THE ORIGINAL ARTICLES in this paper are mostly set in solid type, giving in our columns one-third more reading than is contained in ordinary leaded matter.

Our latest forms go to press on Thursday evening.

San Francisco:

Saturday Morning, May 20, 1876.

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Side Industries of the Salt Mines in Strassfurth, Prussia.

Manufacturing chemistry has never been supplied with such an abundance of crude material as in the salt mines of Strassfurth, in the Prussian province of Saxony. The discovery of enormous amounts of potassa being contained in all the waste and shale of this almost endless deposit of rock salt, caused, soon after the opening of the mines in 1860, an industry to rise which is very little known but nevertheless gigantic and of an incalculable value, namely: the manufacture of potash and salts of potassa.

The masses of rock salt produced are nearly equalled by those of potassa salts gained by a chemical process out of material formerly considered valueless.

The following figures of annual productions will give our readers some idea of the dimensions of this branch of industry:

Chloride of potash (which is worked into potash, sulphate of potash, saltpeter, alum, etc.), 50,000 tons; potash fertilizers of various compositions, 62,000 tons; sulphate of magnesia, 12,500 tons; glauber salts (from mixed solutions of sulphate of magnesia and rock salt), 75,000 tons; chloride of magnesium, 6,500 tons; boracic acid, 20 tons; and bromine, 35 tons.

This great deposit in Germany is equalled by no other in the world except by one in Wieliczka (Hungary), the development of which was unfortunately badly crippled by rash and swindling speculations.

Ventilation of Mines.

No miner can be too much impressed with a sense of the great importance of good ventilation. This air we breathe consists mainly of the two gases oxygen and nitrogen, mingled together in the proportion of about one part oxygen to four parts nitrogen. It is the oxygen which is really necessary for the support of life, whilst the office of the nitrogen is to dilute it and to increase its volume. The air being taken into the lungs in the act of breathing, the oxygen combines with spent carbon from the blood and is thereby converted into carbonic acid, or, as it is sometimes called, carbonic anhydride. Carbonic acid is always injurious when breathed, even if it is mixed with a large volume of pure air, and it should therefore be removed as fast as it is formed. When men work in the open air the carbonic acid formed is very speedily dispersed, and as the supply of pure air is abundant no ill effect follows. But it is otherwise in rooms, and more especially in mines; here the air soon becomes unfit for use if it is not constantly removed, hence the necessity for great care in ventilation. The impurities imparted to the air by the exhalations from the body and lungs are much increased in mines by the constant use of candles or lamps which take away a proportion of the necessary oxygen, and by the explosion of gunpowder or other agents used for blasting. Until within late years comparatively little attention has been paid by companies in this country to the proper ventilation of mines, the miners themselves being the sufferers. Now, however, in the larger mines the question of ventilation is so intimately connected with that of profit that the very best appliances known are used for providing proper ventilation. Winzes are sunk, drifts and connections made, and even costly shafts sunk, simply to give the miners good air so that they may pursue their work with advantage. It is hot enough, usually, below ground, even at the best, and in all cases every care should be taken to see that mines are properly ventilated and cooled.

The miner has always a good test at hand for the fitness of the air he is breathing. If his candle or lamp burns brightly and well the air is fit to breathe, but if he has great difficulty in keeping it alight when the air is still, or if the flame becomes larger and of a pale blue color and flickers greatly or goes out, it is time for him to go out too, as the air which does not support combustion will not support life, and some artificial means of ventilation becomes necessary or the miner's health will give way. This is aside entirely from the question of heat, for the air may be pure and still hot, although perfect ventilation generally assures coolness as well.

Golden State Iron Works.

At these works they now have a number of miscellaneous orders, but they are principally engaged in new and repair work for quicksilver mining companies. They are now making some nine-foot retorts for the Sulphur Bank quicksilver mining company, and have just shipped six condensers to the same company. They have just completed a bench of retorts for the Eureka quicksilver mining company at Ont Hill, Lake county; and also a bench of retorts for the Redington quicksilver mining company. They have made three sets of improved prism pipes for quicksilver furnaces, two sets for the Oceanic and the other for the Ocean View quicksilver mine, San Luis Obispo county. They are putting in several sidewalk hoists in the city, and next week will commence three new elevator hoists. These are after the pattern of Round's patent hydraulic hoists. There are also being made some dump cars for the Great Eastern quicksilver mining company, and several amalgamating pans for the Blue Ledge mine, belonging to an English company. Some work is also being done for the Comanche mine, in Mono county, and for the Indian Queen mine. A large set of hoisting works was shipped from this foundry last month to the Virtue mine in Oregon. The pump wheel was seven feet in diameter, eight inch face.

They are just shipping off two of the Frue concentrators to the Bunker Hill mine, Amador county. In this machine there is an endless belt with raised sides, to which is given a quick lateral motion, and also a slow movement up an incline of from one to twelve inches. A rubber belt is used. The ore is fed on the belt by a spreader. The tailings or lighter portions are carried off at the lower end, through the main box. The quick lateral motion keeps the ore on the belt agitated so as to allow the mineral or heavy parts of the ore to settle through the pulp to the surface of the belt, where it is carried up the incline over the head of the machine, and into a tank of water through which the belt travels, depositing the concentrated material. The capacity of this machine is from seven to eight tons per day, and it is stated that one-half horse power will operate it. We were told when we illustrated this machine in the Press in July, 1875, that there were twenty-four of them in use at Silver Islet, Lake Superior. Those referred to above are the only ones we know yet in use on this coast.

Virginia City and the Comstock Mines.

NUMBER THREE.

[By our Resident Correspondent.]

Having given some account of the Wells-Fargo last week, with a brief mention of this Troy Consolidated, we find next in order the Utah.

This is an old claim, having been located in the year 1859, and is still the farthest north in this district upon which work of any note has been done. It is situated at the head of Seven Mile canon, and at the junction of two smaller ravines, about one mile northwest of the north line of the Ophir. The old company was incorporated under the Nevada law, but in 1871 this was abrogated and a new incorporation had in California. The work done by this old company was west of the location of the present shaft, near the base of Cedar hill. A shaft was sunk about 275 feet and some good ore was taken out. But the new company, considering the dip of the ledge in connection with the angle of the hill, which were about equal, concluded to sink a shaft further east. In this shaft at about 500 feet a troublesome stream of water was encountered, for which the pumping facilities were totally inadequate. After considerable delay a large pumping engine was put up and work was resumed in the shaft, which has now reached a depth of 650 feet, and is still sinking. At 400 feet there is a level, with north, west and south drifts, respectively 400, 700 and 300 feet. Through the west drift connection was made with the old shaft for ventilation.

In the fall of 1875, a few weeks before the disastrous fire in Virginia, the Utah's hoisting works were burnt, at which time all the maps, records, etc., that were kept at the office were destroyed and the machinery much injured. Prompt orders were given for rebuilding, but before timbers could be procured or work commenced the Virginia fire occurred and all lesser interests had to give way to the work of renewal there, and it was not until the completion of the Consolidated Virginia works that a force of workmen could be obtained. The rebuilding is just now completed, and everything presents the appearance of neatness and order. The large pumping engine, one of Booth's, and the double hoisting engine, have been thoroughly repaired and renewed and are working smoothly and well. Fortunately there was not much injury to the shaft, only about four sets of timbers being burned. The most damage was from the water, which nearly filled the shaft and caved in considerable portions of the drifts, which have not yet all been cleaned out. It is found necessary to add another pump, which will be the third, and preparations are now being made for a tank at the present depth of the shaft. Like almost all the mines located on this course, the indications of ore are distinct, and at the 400-foot level the ledge is shown from 75 to 80 feet wide. In this vicinity there are

Many Other Claims,

The most of which are not worked much more than enough to keep alive the title and prevent their relocation. Just opposite and well up the hill is the old Sacramento mine, which in earlier times yielded rich returns from its gold bearing quartz. More recently a mill was erected east of and below the mine for the purpose of working its ores, and a tramway was built to convey the ore to the mill. But at this time the mine is abandoned, the tramway unused and the mill leased out and working on California ore.

Next south of the Utah are several companies that are doing nothing, or a little work by hand, and these are passed for the present. The next in order is the

Phil. Sheridan,

Which is one of the early locations, dating from 1861. Like most of the older companies, their first incorporation was under the Nevada law, which was dissolved and a new company formed under the California law. The first prospecting was done by means of a tunnel, a long one being run well up the side of the hill. Vein matter was reached at a distance of 100 feet and it was continued about 400 feet further, passing through quartz, porphyry, clay carrying gold and ore. The vein was found inclining very decidedly to the east, and it was determined to move several hundred feet down the hill and work through a shaft. In July, 1874, the shaft had reached a depth of 180 feet and a drift of 80 feet had been run towards the ledge, cutting a small body of vein matter on its way and having every indication of approaching the ledge which was cut in the tunnel. After the suspension of the Bank of California work stopped and has only recently been resumed. Now it is being vigorously prosecuted. A new building has just been completed over the hoisting works and the water is nearly all out of the shaft. It is intended to sink the shaft to a depth of 400 feet, before running another drift. The engine has sufficient capacity for depth of 1,500 to 1,800 feet.

There are

No Unusual Developments

To note for the past week. Though the average and every day work of the mines would be

remarkable anywhere else, here nothing less than the discovery of a new and rich body of ore, the millions in which could be calculated, would make a ripple. This hulsion producing mines are confidently expected to come up to their standard and they do not disappoint, the shipments being fully sustained. The product would be much larger if the milling capacity was greater, and that is about to be increased by the erection of an eighty stamp mill by the California company. Others are also projected and it is said that the Consolidated Virginia will rebuild their large mill which was burned last fall. The companies that have not yet reached paying ore and are still prospecting, seem to be fully as active as those that are turning out bullion. A visit along the whole line from the Utah, north, to some distance below Silver City during the past week convinces me that there is a general feeling of encouragement and belief in the future which has hardly ever been exceeded. Improved machinery and appliances contribute largely to this result. Hereafter, when some powerful pumps and other machinery now being put up is completed, it is proposed to give your readers a detailed description of their structure and working. From the great amount of building that is going on everywhere, the town still presents a very unfinished appearance. Building material is scattered promiscuously on streets and sidewalks to such an extent that careful engineering is needed to get through or by, and for the past week the difficulties have been increased on O street by the laying down of new water mains. The water company is providing for an increased supply, intended to meet any future demands. An account of this company's operations is also reserved for a future letter.

Virginia, Nevada, May 16th.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency the following are worthy of mention:

POSTOFFICE LETTER BOXES.—Elisha T. Barlow, S. F. This invention relates to letter boxes, such as are used in postoffice deliveries, and its object is to provide a convenient means for removing letters from the box. In the ordinary construction of such letter boxes it is necessary for the interior of the box to be large enough to admit the hand and arm of the person who removes the letters. The improvement consists in providing each letter box with a sliding bottom or a sliding bottom with slides which can be drawn out like a drawer for the purpose of taking out the letters in the box so that they can be removed without placing the hand inside the box, thus permitting a smaller sized box to be used. The letters deposited in the box through the rear end will be received by the drawer and when the drawer is pulled out the contents can be readily removed, when the drawer is pushed back and the door closed and locked in the usual way. This economizes space and a much smaller space can be made to answer the same purpose, while it is at the same time more convenient.

IMPROVED KITCHEN TABLE.—Chas. Townsend, Oakland. The object of this invention is to provide an improved table for kitchen use, which will not only be provided with drawers for containing flour and small articles used in cooking, but will also have a sliding board board which can be drawn out upon either side of the table. When the kneading board is closed into the table it is entirely out of the way, and when it is required it is within convenient reach, it being only necessary to draw it out like a drawer. The kneading board will be very convenient in case the table is used as a dining table, as it will serve as an extension for certain articles usually placed on a side board. We illustrated this invention in a recent issue of the Press.

BREECH LOADING ORDNANCE.—J. R. V. Owen, Hamilton, Nev. Mr. Owen's invention relates to an improved arrangement or device for loading cannons of all kinds and it consists of a peculiar interior configuration of the breech of the gun, together with a breech key so shaped as to enter the breech by a direct movement from the rear, and then, by a quarter turn, close and lock the same securely. This is an important invention which we shall shortly describe in detail with appropriate engravings.

THE railroad tunnel at Tomales is completed, and Mr. Wood, the contractor, has moved his camp to the vicinity of Valley Ford. A large force is employed and grading is going on for several miles north of Tomales. The distance from that place to Valley Ford by the line of the railroad is six and a half miles, and to Freestone, ten miles. To the latter place it is expected the road will be in running order early in July.

RICH ore is reported as having been struck in the Paymaster mine, Peavine district. The body is eight feet in width, and is the freest milling ore yet produced by the mine. Ore enough is in sight to run the mill one year.

THERE is intended to be a grand jollification at Nevada City on Saturday, connected with the ceremony of driving the last spike in the Nevada County narrow-gauge railroad.

Philadelphia Machinery Manufactories.

The vast creative and beneficent aids to the development of manufactures, the facilitation of extraordinary accomplishments, the ingenuity and complex arrangements of certain proportionate parts, the wonderful performance of machinery, is more the result of intelligence of the last quarter of a century than ever dreamt or thought of in the slow times antedating that period. The distinction between the periods named is most strikingly seen in the new and various appliances for the performance of every species of labor, and the surprisingly fine work, the wonderful ingenuity which has been brought to bear and make capable the accomplishment of any difficult undertaking, with the essential characteristics of cheapness, increased productive qualities and less manual occupation. Many instances might be adduced as a test of the comparative advance of machinery of one year over another, this condition of affairs materially aided through efforts to devise new processes or mechanical arrangement in order to perform new work, the object being to adapt such mechanical arrangement of parts to the accomplishment of a certain desired result.

Much of original ingenuity in the way of difficult machinery can be directly traced to individuals in small towns as well as those in large cities, and to mechanics whose practical knowledge far outstrips all theoretical acquirements. Many of the hard working, greasy, indifferently-clad machinists, so conspicuous in our machine shops, are the originators, and from whose studious minds were born such mechanical contrivances as are worthy the offspring of gods. It is not the demonstrators of mechanics in any or all its branches who come before us as inventors, but the proficient practical operator and experimenter, the studious, careful and diligent workman—the mechanic. Among the

Successful Inventors and Manufacturers

Of our chief cities, the Meers, Chambers, Bro. & Co., of Philadelphia, are eminently conspicuous, the fame of their establishment being world-wide, and notable as the only similar one in the United States, the several descriptions of machines made not only vying in every particular with those made abroad, but in many important parts superior to similar machines of European construction. And this laudable result is due to the enterprising spirit and advanced intellectual acumen of two brothers, whose original pursuits were in no manner connected with mechanics or any of its essential concomitants. We refer to the brothers Edwin and Cyrus Chambers, manufacturers of book and newspaper folding machines, brick machines, bolt and pivot clippers, etc. The former, now deceased, early allied himself to his brother's fortunes, and through a course of many years, labor, capital and vast profundity of knowledge of mechanism have been called into requisition for the proper construction of the machines, and to have them arrive at a point of superiority hitherto unattained. The entire duties of the establishment now rest upon the shoulders of Mr. Cyrus Chambers, Jr.

Philadelphia and its vast manufacturing and inventive talent can exhibit no greater instance of remarkable powers than have been clearly evinced in the career of this gentleman. Early endowed with a love for mechanical invention, and possessing the indomitable spirit essential to the accomplishment of any great undertaking, he began the series of trials, inventions, undertakings, which led to the grand results achieved and which place him in the foremost list of inventors in this country or the world. It would be a somewhat difficult task on our part to trace from the fountain head the machines we have named, and more particularly the book and newspaper folding machine, or give even a brief mention of the innumerable trials, disappointments and partial glimpses of renown on the part of Mr. Cyrus Chambers, Jr. on his road to success.

It will suffice when we inform our readers that the manufacturing establishment of Chambers, Brother & Co., situated on Fifty-second street, below Lancaster avenue, Philadelphia, is comprised in three acres of ground—the building and adjoining property. Here at all times is presented a busy scene of activity, and from here the machines go out to all parts of the world.

Foremost in the list of manufactures, as regards invention and construction, stands the unrivaled

Book and Newspaper Folding Machine,

The emanation of 20 years' study and labor. The finest books are folded by them with accuracy, speed and economy. A corroborative of their superior claims, it remains for us to remark that all the large book and newspaper publishing houses in the East employ them, as well as establishments as far west as the Pacific slope.

That these machines must necessarily come into greater prominence in California, it is useless for us to argue. Their now extended use in European countries, and the commendations bestowed upon their inventor, Cyrus Chambers, Jr., afford evidence of their superiority over all similar contrivances. The book folding machines will fold an 8vo at about one-fourth, and a double 12mo at one-sixth of the cost of

doing the same work by hand. The newspaper folding machines have now become pretty generally adopted throughout the country. The folding and pasting machines and the folding, pasting and covering machines do work that has not heretofore been done at all, and will fold, paste and cover 8, 16, 24 or 32-page pamphlet at about one-eighth the cost of hand folding, the machines being admirably adapted for binding periodicals, almanacs, etc. Chambers' embossing press, Chambers' automatic feeding board-enter, are unique in their construction and the amount of work which they do.

One of the early successes of this house is the brick-making machine, which is said to be the most perfect working machine of the kind in the United States.

The Bolt and Rivet Clipper.

Is manufactured in three sizes, ranging in price from \$7.50 and \$9 to \$12, is a little device for cutting off the ends of bolts and rivets, on carriages, wagons, harness, etc., also core rods in foundries, etc., and is the best instrument of the kind ever devised. They are used generally by carriage makers, the wheelwright, blacksmith, and wherever bolts and rivets are used.

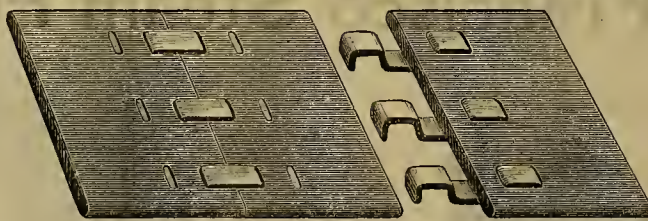
It must not be thought that the wonderful instruments and devices of this establishment of which we treat are the emanations of a short



TABER'S IMPROVED HAY FORK.

period of time. Indeed, they are the result of many years of labor, advanced knowledge of mechanics, and expenditure of capital. To the surviving brother of the firm we are indebted for the successful accomplishment of the machines and their now extended use throughout the world. The machines named will be exhibited at the Centennial exhibition and their practical importance demonstrated to thousands of people of every nation and clime. H.

IMPROVED BELT HOOK.—We illustrate on this page Sherman's patent double-hitch belt hook, which is being introduced on this coast by



DOUBLE HITCH BELT HOOK.

T. L. Bailey, of Batavia, Solano county. This hook retains its original shape in the belt, and can be used until worn out. It is an excellent substitute for lace leather. The cut conveys a correct idea of the manner of adjusting these hooks. It will be observed that the substantial double bearing of each hook precludes the possibility of "tearing out."

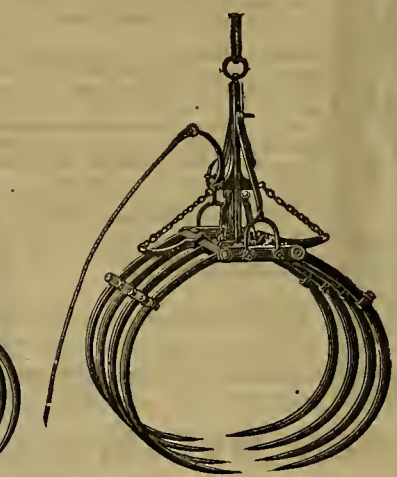
JUNGES AT THE CENTENNIAL.—Among the American judges who are to pass upon the articles at the Centennial, are the following: On mines and metallurgy—S. B. Axtell, of New Mexico; J. W. Mackey, of Nevada; J. D. Hagne, of California; W. S. Keyes, of Nevada. On animal and vegetable products—General H. M. Naglee, of California. On furniture, upholstery, etc.—General Gibbons, of Montana. Wool and silk fabrics—H. C. Goodspeed, of Utah. Jewellery, silverware, bronze, etc.—Peter Gottschell, of California. Machines, tools, wood, metal and stoves—Irrving M. Scott. Machinery for making clothing and lace—L. B. T. Poor, of Dakota. Agricultural implements—James Bruce, of Oregon.

NEW TUNNEL.—The Eberhardt and Aurora silver mining company at White Pine broke ground for their new tunnel on the 12th inst. commencing in Mahogany canon, cutting the Eberhardt and South Aurora mines in its course. Burleigh drills and other modern appliances will be used to hasten the work.

The first car between Colfax and Nevada City is to be fitted up elegantly by the ladies of the town last mentioned.

Taber's Improved Hay Fork.

We give illustrations on this page of an improved horse hay fork recently patented by Orrin Taber, of San Jose, through Dewey & Co's agency. This useful farm implement has in the short time since it was put into work secured more than the usual amount of approval from those who have given it full trial. We have seen most favorable testimonials of its excellent and efficient work. Mr. Taber's improvement over other hay forks of similar model lies in ingenious mechanical devices for operating the two sets of fingers, by which the requisite amount of strength together with positive action of the grasping and releasing fingers are secured. The heads of the two sets of fingers are joined in the opposite ends of two end plates, and these end plates are connected together between the heads by means of rods or bars which extend across parallel with the heads, thus providing a spacing frame for separating the heads and permitting the points of the fingers to describe a larger curve when they open and close than if the heads were closer together, consequently causing them to enter the body of hay with greater ease. This improvement is a very val-



TABER'S IMPROVED HAY FORK.

uable feature of the fork and its result in working is readily perceived.

The great value in the patent, however, lies in the arrangement for holding the load and for releasing it when the place of deposit is reached. This work is wholly automatic and consequently very important as a labor saving feature. The arrangement is such that when the load is gripped the weight of the fork and its load are suspended from a lifting bar, and as this lifting bar is attached to crank arms which act upon the fingers or teeth, the pull upon it closes the fork. When the fork has been lifted to the point where the load is to be deposited, a light pull upon a rope which is

Gems and Precious Stones.

[Written for the PRESS by HENRY G. HANES.]

(Continued from last week.)

B.—Sapphire, Asteria or Star Sapphire, Oriental Amethyst, O. Emerald, O. Ruby, O. Topaz.

The above are names given to varieties of the same mineral which is properly corundum crystallized, the main difference being color, although it will be shown that the specific gravity of varieties differs. The name sapphire generally refers to the blue or white variety. A red sapphire is a ruby, a yellow one a topaz, and the green is an emerald. The word oriental prefixed shows that they differ from other stones of the same name, but of inferior quality. They are so called because the best stones come from India. Corundum takes its name from a Hindoo word, *korund*. The name generally applies to the opaque and massive varieties. Emery is a coarse, impure variety, which is well known as a polishing material. Its color is black or grayish black color. It is an intimate mixture of corundum with hematite or magnetite; much resembles a fine grained iron ore.

Corundum is found in several forms. Adamantine spar from India is black, dark gray or smoky tint, sometimes crystallized, but generally massive. It has no value except for polishing purposes, being in fact a pure emery. Emery occurs in several localities in the United States: in Massachusetts, New York, Maine, Connecticut, New Jersey, Pennsylvania, North Carolina and in Canada. The only known locality in California is Los Angeles county, in the drift of San Francisco pass, where it has been observed in small quantities.

It is found largely in Asia Minor, near Ephesus. It occurs also in China, and, in fact, is quite common in small quantities in different parts of the world. Although the coarser kinds are so common, yet the crystallized varieties are extremely rare, and are second only in beauty and value to the diamond.

The white sapphire is almost equal to the diamond as a gem, and is nearly as hard. It has a specific gravity of 3.95-4.16; hardness, 9. Its composition is pure alumina (Al₂O₃) oxygen 46.6, aluminum 53.4=100. Before the blowpipe it is unaltered. With borax the pulverized mineral dissolves slowly when strongly heated, yielding a colorless glass. It is not acted on by acids; acids do not attack it. The finely pulverized mineral, if wet with a solution of proto-nitrate of cobalt and strongly heated becomes blue, which is the well known reaction of alumina. If fused with bi-sulphate of potassa it becomes decomposed and dissolves in water, from which the alumina may be precipitated by ammonia.

The sapphire in any of its varieties is electrical when rubbed, by which it may be distinguished from other similar stones which are not.

Sapphires are found in the sand of some rivers associated with zircon garnets, magnetites, chromite iron and other minerals, and in basalt. The luster of the sapphire is adamantine or vitreous; fracture conchoidal, uneven.

The specific gravity of the different varieties is as follows: blue, 3.979; red, 3.909; green, 3.949; violet, 3.921.

(To be Continued.)

Heat and Mechanical Force.

EDITORS PRESS:—In your issue of March 25th, your correspondent "Observer" propounds some questions upon heat and mechanical force, as applied to an ordinary non-condensing steam engine, at 60 pounds pressure. It would seem to me that the unit of heat, applied as above, would exert a mechanical force which would raise one pound only about sixty feet high. In a steam cylinder, cut off at one-fourth the stroke, the unit of heat would raise one pound about 120 feet high. Cut off at one-twelfth the stroke with steam at 150 pounds pressure to the square inch, the same equivalent of heat would raise one pound 240 feet high.

Making fair allowance for loss of heat, it would require about four pounds of the best anthracite coal in the first case stated, two pounds in the second, and one pound in the third per hour, to produce one practical horse power.

A good condenser would save, or economize the above statements, both as to fuel and power, say 15 percent.

These are the best results we shall probably ever obtain from the most perfect steam engine.

If it were possible to confine a given quantity of water at boiling point in a cylinder and impart to it about 1,000 additional units of heat to each pound of water, then allow it to expand against the piston throughout 1,600 times its volume and add together its expansive force exerted at all points in length of the cylinder, and divide by the total number of points, you will have a force about equal to Joule's equivalent.

STEAM.

San Francisco, May 15th, 1875.

A great celebration and reunion of old residents of Nevada county will take place at Nevada City on the 26th inst.

AGENTS.—Mr. C. N. West will act as agent and correspondent for us in Santa Cruz county, and Mr. F. A. Schofield, at Santa Rosa and vicinity.

THE BUCKMINSTER ROCK DRILL.

The Most Efficient Rock Drill in the Market.

LIGHT, STRONG and DURABLE.

No External Machinery Liable to Injury from Rough Usage, as all the Working Parts are Enclosed in the Cylinder and Valve Chest.

A TRUE SMOOTH HOLE EVERY TIME. THE MOST ECONOMICAL DRILL YET MADE.

THE WORKING PARTS OF THE DRILL ARE FEW AND SIMPLE IN ARRANGEMENT, SO THERE IS NO LIABILITY OF INJURY. THE CLAMPS FOR HOLDING THE DRILL ON THE TRIPOD, FOR HOLDING THE DRILL TOOL IN POSITION, AND FOR FIXING THE WEIGHTS ON THE LEGS OF TRIPOD, ARE ALL IMPROVED AND VERY EFFECTIVE.



The device for rotating this Drill has few parts, and can not get out of order. There is no chance for wear. The motion is positive, and never fails of action. The Drill Carriage can be turned clear round the column, and can also turn in a complete circle on the head of the clamp.

All parts subject to wear are of the Best Cast Steel, and all made to gauge and interchangeable.

This is the Lightest and Strongest Rock Drill yet invented. Being nearly all Cast Steel, it is easily handled and moved, as all superfluous metal is dispensed with.

We also call the attention of those interested to the Horizontal Air Compressor furnished with the Buckminster Drill when desired. It is Economical, Light, Easily Run and conveniently portable.

We claim that the Buckminster Drill will do as good work as any in the market, at a much less expenditure of power, and a great decrease in first cost of machinery. Drills made all the usual sizes.

Mining Companies Desiring Rock Drilling Machinery should Examine this Drill and Air Compressor, and we are confident that it will give satisfaction. Address,

PACIFIC IRON WORKS,

FIRST & FREMONT STS., NEAR HOWARD, S. F.
MANUFACTURERS OF ALL CLASSES OF MACHINERY.



GOLD MEDAL

AWARDED TO

San Francisco Steam Pumps.



AFTER ONE OF THE

MOST THOROUGH TRIALS

Ever Had in the United States,

BETWEEN COMPETITORS

—OF—

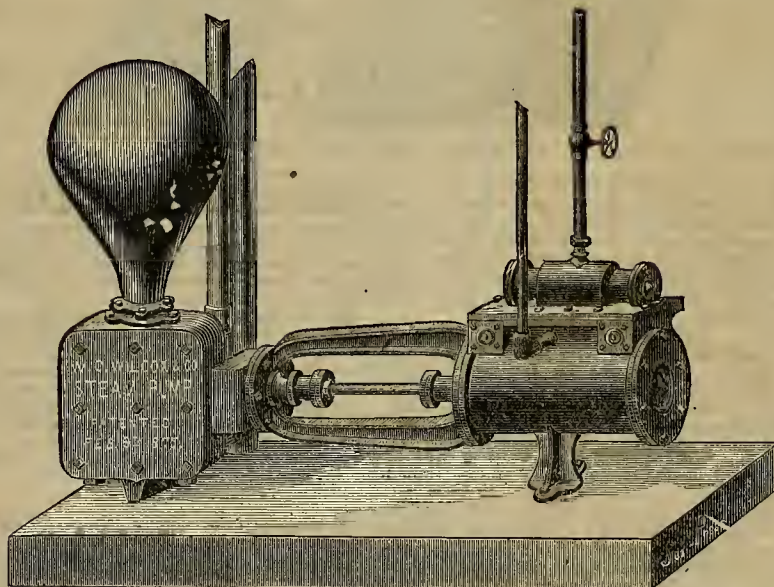
Best Established Reputation,

In which, at great expense, the different Steam Pumps were tried under every test known to experts, the Examining Committee of the Tenth Industrial Fair of the Mechanics' Institute have awarded to us their

GOLD MEDAL

—FOR—

Best Steam Pumps on Exhibition.



We are prepared to furnish PUMPS UNDER CONTRACT, guaranteeing their ability to perform any specific work for which steam pumps are adaptable, such as

RAISING WATER FROM MINES,

FOR WATER WORKS,

FEEDING BOILERS, RAISING WATER FROM WELLS; STEAMER AND SHIP PUMPS, ETC.

We would also call the attention of those interested, to our Direct Acting Deep-Well Pumps for raising water from

Any Desired Depth.

Also to our Especial Construction of Pumps FOR HANDLING QUICKSILVER or heavy liquids.

We claim that our Pumps are the best ever made in simplicity of construction, economical use of power, durability and perfect adaptability for general uses, and we ask all persons interested to investigate our title to this claim. Salesrooms at our Machine Shop, 114 and 116 BEALE STREET, SAN FRANCISCO.

W. C. WILCOX & CO., Proprietors.

THE EXPLORERS', MINERS' AND METALLURGISTS' COMPANION.—Comprising a practical exposition of the various departments of exploration, mining, engineering, assaying and metallurgy; containing 672 pages and 83 engravings. By J. S. Phillips, M. E. Price, cloth, 10.50; in leather, \$12; postage 50 cts. Sold at this office.

SUBSCRIBERS are requested to examine the printed address on their papers. If mistakes occur at any time, please report them to this office. The last figures (at the extreme right) represent the year that your subscription is paid to. Next to these the day and month is represented. For instance, your subscription being paid to July 4th, 1876, it would be represented, viz: 4 76; or 4/176.

THOUGHTLESSNESS.—Persons sometimes return the paper, marked "stop this paper." Their name being pasted on the sheet they think that is all we need to be able to cross their names off. Now that is thoughtlessness. Your P. O. address is needed as much as your name. We have thousands of names arranged only according to locality. Our mailing clerk does not know where everybody lives.

ANGELL'S CHARCOAL DENTAL SOAP
for Whitening and Preserving the Teeth, J. W. ANGELL, Prop., San Francisco.

\$5 to \$20 Per Day at home. Terms free. Address G. Strinson & Co., Portland, M.

California Planers and Matchers, and Wood Working Machinery of all Kinds

California Planer and Matcher

Is gotten up from new patterns specially for this Coast. It has Cast Steel Slotted Cylinder Head, running in patent self-oiling boxes; will plane 24 inch wide and six inch thick, and tongue and groove 14 inch wide. Will make rustic and stick gutters, or heavy mouldings, etc., and is the best job machine ever built. We have always on hand these machines with or without under cutter head, also, a large assortment of Planing Mill Machinery.



SMITH'S PATENT POWER MORTISERS,



Mortiser.

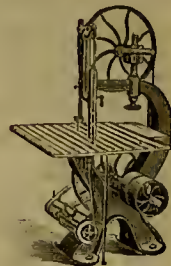
WITH LATE IMPORTANT IMPROVEMENTS.

Smith's Celebrated Molders.

We have four sizes of these Machines always on hand—"B," "C," "D" and "E,"—to work either three or four sides. Have slotted heads and all other improvements, and may be seen in any mill on the Coast. Prices reduced to 15 per cent. less than Eastern list. We have also, a large stock of all kinds of Planing Mill Machinery, such as Molders, Mortisers, Tenoners, Band and Jig Saws, etc. Send for our new Illustrated Catalogue. BERRY & PLACE, Selling Agents.



Smith's Celebrated Moulders.



Patent Band and Jig Saw

BERRY & PLACE, Agents,

MACHINERY DEPOT:
Market, Head of Front Street,

San Francisco.

PACIFIC MACHINERY DEPOT,

H. P. GREGORY & Co., Nos. 14 & 16 First Street,

P. O. Box 168.

San Francisco, Cal.

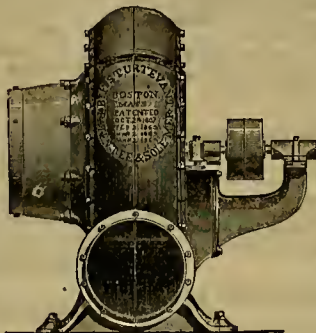
SOLE AGENT FOR THE PACIFIC
COAST FOR

J. A. Fay & Co's Wood-
working Machinery,

Blake's Patent Steam
Pumps,

Tanite Co's Emery Wheels
and Machinery,

Fitchburg Machine Co's
Machinists' Tools,



Sturtevant Exhaust Fan for Remov-
ing Shavings and Sawdust
from Machines.

Sturtevant's Blowers and
Exhaust Fans,

J. A. Roebling's Sons Wire
Rope,

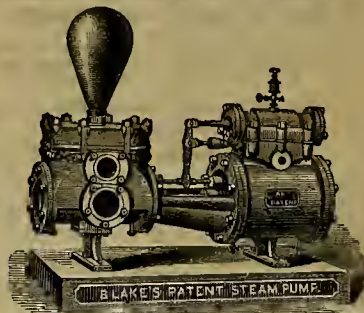
Pure Oak Tanned Leather
Belting,

Perin's French Band Saw
Blades,

Planer Knives,

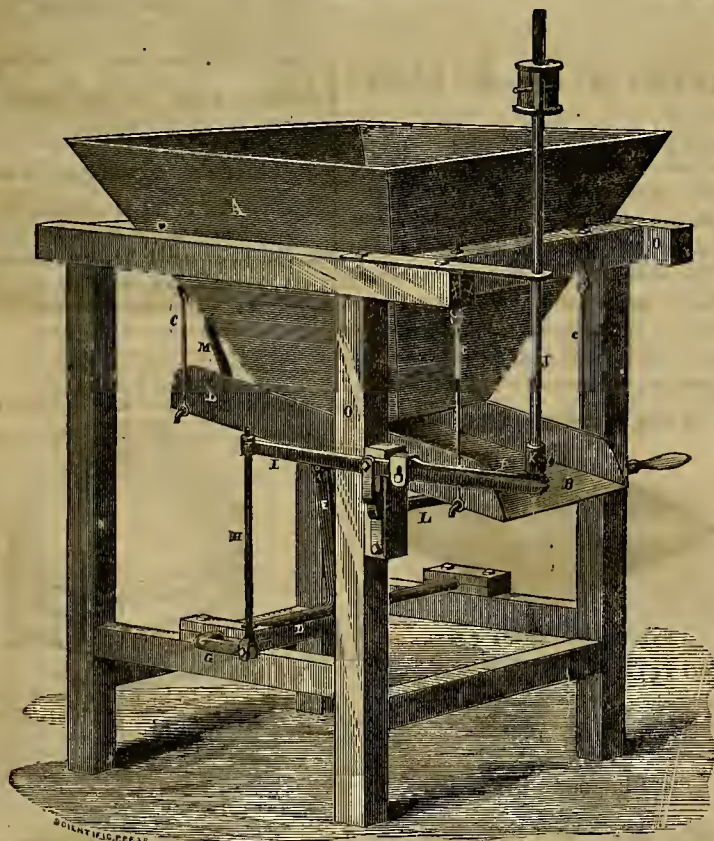
Nathan & Dreyfus' Glass
Oilers, and Mill and
Mining Supplies
of all Kinds.

BLAKE'S PATENT STEAM PUMP



Over 8,500 in Successful Use in the United States.

TULLOCH'S AUTOMATIC ORE FEEDER.



The TULLOCH AUTOMATIC ORE FEEDERS have been practically tested during the last year and a half in twenty-seven mills, of from five to eighty stamps each, and have, in every case, given perfect satisfaction. Refer to the following Mills: California, Con. Virginia, Northern Belle, Leopard, Trench, Humboldt, Douglas, Phoenix, Hite, Crescent, and others. Prices Reduced. Send for Circulars.

F. OGDEN, Sole Agent,
417 Market Street, San Francisco.

IRON PIPE

FOR GAS, STEAM AND WATER,

Galvanized, Enameled and Black, 1-4 to 12 inch Diameter.

SEAMLESS

LAP-WELDED PUMP COLUMN,

ALL SIZES, TO 15 INCHES DIAMETER.

HYDRAULIC MINING PIPE,

GAS AND WATER MAINS.

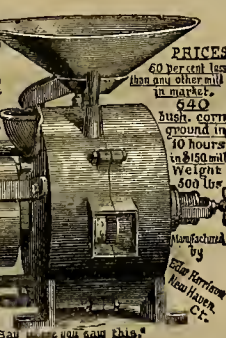
FOR SALE BY

DUNHAM, CARRIGAN & CO.,

107, 109 and 111 Front Street, San Francisco.

The
HARRISON
Burr Stone
MILLS.
\$1000 CASH
Offered for
their EQUAL.

Will
grind
any-
thing
Send
stamp
for
new
Illustrated
Catalogue
Just issued.



PRICES
60 per cent less
than any other mill
in market.
\$400
bush. corn
ground in
10 hours
in 150 mill.
Weighs
500 lbs.
Manufactured
by
Harrison
New Haven,
Conn.

G. W. & C. A. LANE, Exeter, N. H., write, Dec. 13:

"We started the heavy 20-inch Corn Mill last Friday you sent to Baldwin & Tabor, Manchester, N. H. We ran it most all day, and ground 60 bushels corn per hour. The mill you sent us at Haverhill, Mass., for A. S. Hook, is doing wonderfully. It is grinding on an average 2,500 lbs. good meal per hour, and has ground 2,800 lbs. in an hour. It is driven by an engine with a 9-in. cylinder, and takes the place of a 30-in. mill of another kind that, when doing its best and loading the engine with all it could carry, only ground 1,500 lbs. per hour. If there is a mill built that can beat that we would be pleased to see it brought out."

(Continued from page 328.)

Arizona.

PROX DISTRICT.—Arizona Miner, May 5: Houghton & Orrin have let a contract to some parties who are sinking on the Prince. At the Black Warrior evidence of active operations was visible in healthy looking dumps of fine looking ore. Monk & Co., who have a lease on the Evening Star, were preparing a slide, buckets, etc., and getting ready to commence sinking. Mr. Coe was clearing away a place at the mouth of the McKinnon & Goodwin tunnel to sink a shaft some 200 feet as preliminary to further operations.

Rod McKinnon was sinking and doing assessment work on an intervening claim between the mine they sold to Coe and the Jackson or War Eagle claim, on the same ledge. All these mines will receive attention as they are developed.

Idaho.

ORO FRO.—Owyhee Avalanche, May 6: Orders came from San Francisco a few days ago to parties here directing them to resume paying off claims against this mine. The indebtedness is being gradually reduced, and it is believed that matters will soon be in shape to pave the way for the resumption of work in the mine. We hope so.

THE GOLDEN CHAMBER.—We continue to receive the most favorable reports of the condition and prospects of this mine. Superintendent Baldwin assures that all the recent developments continue to be most favorable, and that there is every prospect of reaching the promised bonanza at the 13th level. Shares have been recently selling at \$4 and upwards.

The great majority of the workmen in this camp have come up nobly in the way of surrendering their claims against the mine, with a view of throwing aside all obstacles in the way of resuming work. All honor to them for their manly course in making such sacrifices.

SOUTH MOUNTAIN.—Mr. Bowyer, Secretary of the South Mountain Consolidated mining company, arrived here yesterday from South Mountain. We are pleased to learn from him that the indications are very favorable for the resumption of mining operations in that camp early in summer. Some of the small lien holders are disposed to be dissatisfied at the course matters have taken, but it is earnestly hoped that they will see the propriety of compromising and getting what they can, so as to leave no obstacle in the way of resumption. When the works are started all concerned will be benefited.

A Weekly List of U. S. Patents Issued to Pacific Coast Inventors.

FROM OFFICIAL REPORTS FOR THE MINING AND SOLENTY PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.

By Special Dispatch, Dated Washington, D. C., May 16th, 1876.

FOR WEEK ENDING MAY 2ND, 1876.*

CARS FOR ONE RAIL RAILWAYS.—David B. James, Visalia, Cal.

PEN RACKS.—Carol E. Knisel and Carl H. E. Beckert, Oroville, Cal.

BRECK LOADING ORDNANCE.—Joseph R. M. Owen, Hamilton, Nevada.

SASH PULLEYS.—Arthur R. Watterson, San Francisco, Cal.

ADJUSTABLE WATER GATE AND GAUGES.—Thomas Gnerin, San Francisco, Cal.

HORSE COLLARS.—Adam Rutherford, Walla Walla, Washington Territory.

WATER CLOSET VALVES.—William Smith, San Francisco, Cal.

FRUIT DRIERS.—Oscar F. Tiffany, San Francisco, Cal.

REISSUES.

GRINDING AND AMALGAMATING PANS.—Charles Cummings, Virginia City.

TRADEMARKS.

COSMETIC.—Edgar B. Whitney, San Francisco, Cal.

DEWEY & CO.,

United States and Foreign

Patent Agents,

No. 224 Sansome St.
SAN FRANCISCO.

Patents Obtained Promptly.
Caveats Filed Expeditiously.
Patent Reissues Taken Out.
Patents Secured in Foreign Lands.
Assignments Made and Recorded in Legal Form.
Copies of Patents and Assignments Procured.
Examinations of Patents made here and at Washington.

IRON PIPE.

Having been appointed Agents for the Washington Pipe Works, we are prepared to ship from store, Pipe and Fittings at the lowest market prices.

BERRY & PLACE, San Francisco.

TREADWELL'S OLD STAND.

SAN FRANCISCO

Pioneer Screen Works,

Removed to 32 Fremont Street, near Market.

J. W. QUICK.

Manufacturer of perforated sheet metals of every description, at reduced rates. Mill owners using Battery Screens extensively, can contract for large supplies at favorable rates. This is the only establishment on the Coast devoted exclusively to the manufacture of screens.

SCREENS

1845.

1876.

CHARTER PERPETUAL.

STRICTLY MUTUAL.

ECONOMY! SECURITY!

Mutual Benefit Life Insurance Company,

NEWARK, NEW JERSEY.

Assets, January 1st, 1876,

\$31,085,011.11.

LEWIS C. GROVER.....President.
JAMES B. PEARSON.....Vice-President.

EDWARD A. STRONG.....SECRETARY.
BENJ. C. MILLER.....TREASURER.
B. J. MILLER.....ACTUARY.

The following is a summary of the business of this company from May 1, 1845:

Total Receipts.....	\$81,149,507 76
Paid Losses and Endowments.....	19,284,641 48
Dividends or Return Premiums.....	19,224,524 15
Surrendered Policies.....	4,284,344 82
Expenses—Management, Commissions, Taxes, etc.....	8,167,913 05
Ratio of expenses.....	5.60 per cent.

These results are more favorable to the insured than those presented by any company in the world.

ALL KINDS OF APPROVED POLICIES ISSUED.

Dividends paid annually, or they can be applied on the Accelerative Endowment Plan, ORIGINATED BY THIS COMPANY, to which particular attention is called.

ACCELERATIVE ENDOWMENT PLAN.

The plan is intended to meet the wants of those who wish protection for their dependents in case of premature death, and at the same time to make a wise provision for themselves in the event of surviving the productive period of life.

The plan proposes that instead of using dividends in reduction of the annual premium, the insured may, at his discretion, pay his premiums in full in cash, and surrender his dividend to the company. In consideration of this surrender, the company will agree to pay the sum assured when the policy-holder shall have attained a certain age, or at his previous death, instead of at death only, thus enabling him to procure an Endowment Policy at the usual rates charged for policies payable at death only.

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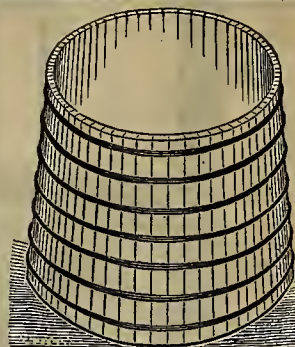
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This system has been in use for over three years
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The senders will please give full address, date of
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Mining and Other Companies.

Persons interested in incorporated shares
will do well to recommend the publication
of the official notices of their companies
in this paper, as the cheapest appropriate
medium for the same.

Amador Canal and Mining Company.

Location of principal place of business, San Francisco, Cal. Location of works, Jackson, Amador County, Cal. Notice is hereby given, that at a meeting of the Board of Directors, held on the ninth day of May, A. D., 1876, an assessment, No. 1, of three dollars (\$3.00) per share was levied upon the capital stock of the corporation, payable immediately in U. S. gold coin, to the Secretary, at 134 office of the company, room No. 2, 418 California street, San Francisco, Cal.

Any stock upon which this assessment shall remain un-
paid on the 15th day of June, 1876, will be delinquent, and
advertised for sale at public auction, and unless payment
is made before, will be sold on Wednesday, the fifth day
of July, 1876, to pay the delinquent assessment, together
with costs of advertising and expenses of sale. By order of
the Board of Directors. J. W. CLARK, Secretary.
Office, Room No. 2, 418 California street, San Fran-
cisco, Cal.

Hope Quicksilver Mining Company.—Lo-

cation of principal place of business, San Francisco, Cal. Location of works, Cannabar Mining District, Sonoma County, California.

Notice is hereby given, that at a meeting of the Board of Directors, held on the 12th day of May, 1876, an assessment (No. 1) of three (3) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold coin, to the Secretary, at the office of the company, room No. 2, 408 California street, San Francisco, California.

Any stock upon which this assessment shall remain un-
paid on the 15th day of June 1876, will be delinquent, and
advertised for sale at public auction, and unless payment
is made before, will be sold on Monday, the 10th day of
July, 1876, to pay the delinquent assessment, together with
costs of advertising and expenses of sale.

JACOB HARRY, Secretary.
Office, Room 2, No. 408 California street, San Francisco,
Cal.

Lady Franklin Gold and Silver Mining Co.

Location of principal place of business, 507 Mont-
gomery street, San Francisco, Cal. Location of works,
Silver Mountain Mining District, Alpine County
California.

Notice.—There are delinquent upon the following
described stock, on account of assessment, (No. 14)
levied on the third day of April, 1876, the several amounts
set opposite the names of the respective shareholders,
as follows:

Names.	No. Certificate.	No. Shares.	Amount.
James Wilson.....	246	5	\$ 2 50
James Wilson.....	250	5	2 50
Donald Davidson.....	136	10	5 00
Donald Davidson.....	137	10	5 00
Donald Davidson.....	193	5	2 50
Donald Davidson.....	257	102 1/2	51 37
Donald Davidson.....	258	13	6 50
T. S. Beaver.....	106	10	5 00
T. S. Beaver.....	287	10	5 00
Alexander Martin.....	266	100	50 00
Alexander Martin.....	267	100	50 00
Alexander Martin.....	218	8 1/2	41 25
Alexander Martin.....	283	30	15 00

And in accordance with law, and an order of the
Board of Directors, made on the third day of April,
1876, so many shares of each parcel of said stock as
may be necessary, will be sold at public auction, at the
office of the Company, 507 Montgomery street,
San Francisco, California, on Monday, the 30th day
of June, 1876, at the hour of one o'clock, P. M., of said
day, to pay said delinquent assessments thereon, to-
gether with costs of advertising and expenses of the
sale.

F. E. LUTY, Secretary.

Office, 507 Montgomery street, San Francisco, Cal.

Mariposa Land and Mining Company

of California. Location of principal place of business,
San Francisco, Cal. Location of works, Mariposa
county, Cal.

Notice is hereby given, that at a meeting of the Board of
Directors, held on the second day of May, 1876, an assess-
ment (No. 5) of one dollar per share was levied upon the
capital stock of the corporation, payable immediately in
United States currency, to the Secretary, at the office of
the company, No. 309 Montgomery street, room 33, Nevada
Block, San Francisco, Cal., or to the Assistant Secretary,
at the office, No. 3 Nassau street, New York.

Any stock upon which this assessment shall remain un-
paid on the third day of June, 1876, will be delinquent, and
advertised for sale at public auction, and unless payment
is made before, will be sold on Friday, the 30th day of
June, 1876, to pay the delinquent assessment, together with
costs of advertising and expenses of sale. By order of the
Board of Directors. LEANDER LEAVITT, Secretary.
Office, Room 33 Nevada Block, No. 309 Montgomery
street, San Francisco, Cal.

Walter Mill and Mining Company.—Prin-

cipal place of business, City and County of San Fran-
cisco, Cal. Location of works, Garden Valley Mining
District.

Notice is hereby given that at a meeting of the Board of
Directors, held on the fifteenth day of May, 1876, an assess-
ment of twenty (20) cents per share was levied upon the
capital stock of the corporation, payable immediately in
United States gold and silver coin, to the Secretary at
his office, 601 Montgomery street, San Francisco, Cal.

Any stock upon which this assessment shall remain un-
paid on the twenty-first day of June, 1876, will be delinquent,
and advertised for sale at public auction, and unless pay-
ment is made before, will be sold on Thursday, the sixth
day of July, 1876, to pay the delinquent assessment, to-
gether with costs of advertising and expenses of sale.

SAMUEL S. MURPHY, Secretary.

Office, 601 Montgomery street, San Francisco, Cal.

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Also manufacture and keep constantly on hand a supply of our

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Are prepared to make SHEET IRON and ASPHALTUM PIPE, of any size and for any pressure, and contract to lay the same where wanted, guaranteeing a perfect working pipe with the least amount of material.

Standard sizes of railroad Car Wheels, with special patterns for Mining Cars. These small wheels are made of the best Car Wheel Iron, properly chilled, and can be fitted up with the improved axle and box—introduced by this company, and guaranteed to outlast any other wheels made in this State.

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Machinery and Castings of all kinds.

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Schofield's SULPHURET CONCENTRATOR.

THE BEST MACHINE IN USE FOR
SAVING SULPHURETS.No Power Required to Run it, and only a Small Stream of
Water under a Light Pressure.

ECONOMICAL,

EFFECTIVE,

DURABLE,

AND SURE IN OPERATION.

The especial attention of parties erecting new mills is called to this
Valuable Improvement.WE GUARANTEE THAT THIS MACHINE WILL SAVE NINETY PER CENT. OF ALL THE SULPHURETS
IN THE ROCK AT A MERELY NOMINAL EXPENSE. IT HAS NOW STOOD THE SEVERE
PRACTICAL TESTS OF OVER A YEAR'S WORK AT DIFFERENT MILLS
ON THIS COAST, AND HAS BEEN EMINENTLY
SUCCESSFUL IN EVERY CASE.The following letters, from practical men who have used this machine, will show to
those interested what it has accomplished:

BANDERETA MINE,

Mariposa County, Feb. 7th, 1876.

CHAS. SCHOFIELD, Esq.—Dear Sir: We have been using your Concentrator at our mill about six months, and find that it saves over 90 per cent. of the sulphurets contained in the ore, and all of the amalgam and quicksilver which escapes from the battery. The machine is simple in construction, perfect in operation, and requiring no power to run it, is very economical. I can confidently recommend it to all mill men as the best and cheapest Ore Concentrator now in use.
Yours respectfully, LEVI NOBBS, Superintendent.

NONPAREIL GOLD MINING CO.'S WORKS,

Deer Flat, Tuolumne County, Cal., April 12th, 1876.

MR. CHARLES SCHOFIELD—Dear Sir: It is four months since the Sulphuret Concentrator you furnished our company's mill with was first put in operation, and during the past three months has been clearly in constant use. The men attending the Concentrator having acquired by practice a thorough knowledge of its workings, there is nothing more to be desired; it is perfect. A number of mill men have examined the Concentrator and its workings, and pronounce it the most simple in its construction, perfect in its work, and cheaply run of any they had seen. If you think by showing this it will assist you in disposing of your Sulphuret Concentrators, you are at liberty so to do, as it will afford me much pleasure in having contributed my little mite towards rewarding true merit. Hoping you will meet with complete success,
I remain yours truly, JOS. J. DuPRAT, Superintendent.

CON. ALABAMA M. CO.,

Tuolumne County, May 1st, 1876.

C. SCHOFIELD, Esq.—Dear Sir: The Concentrating Machine recently purchased of you is now in active operation, and we are highly pleased with it. It saves over 90 per cent. of our sulphurets, and is run with very little expense. We could not afford to be without it, and can safely recommend it to all mill men as the best and most economical machine in use.

M. S. McCONNELL, Superintendent.

WASHINGTON MINE,

Mariposa County, Cal.

CHAS. SCHOFIELD, Esq.—Dear Sir: Having had one of your Double Rigged Concentrators in use now at this Mill for over a year, I take this opportunity of informing you that it is far superior to the old English Boddie we have been using for the last four years, not only in a saving of labor, but having a less waste of sulphurets in washing.

We have the machine connected with the tail sluice, and receives the sand and water direct from the batteries, without any hoisting, and it does the concentration for the 20 stamps easy, with a loss of less than 10 per cent.

Two Chinamen do all the work required—one night and the other day—working 12 hours each, and get out about a ton each day, thus concentrating 30 tons into one, at a cost of less than four dollars. As the cheapest, most economical and best working Concentrator I know of I can recommend it to others without any hesitation.

Yours truly,

GEO. E. WEBBER, Jr.,

Superintendent Washington Mining Company.

MR. SCHOFIELD—Dear Sir: Having carefully examined your Concentrator, which I have seen in successful operation at the Francis Company's Mill and also at the Benton Mills, on the Mariposa Estate. I have no hesitation in saying that it is the most valuable Concentrator I have met with during my long experience as an amalgamator in this country. Its manner of catching quicksilver and amalgam is thorough and complete, and it saves the sulphurets clean and with a loss of less than ten per cent.

Yours respectfully,

L. BURDOW.

MR. C. SCHOFIELD—Sir: I have worked one of your Sulphuret Machines at the Benton Mills about 30 days, and am satisfied it is the best machine for saving amalgam and sulphurets ever used on the Mariposa Estate.

L. GILMAN.

The following testimonial is from the well known mining expert, PROF. J. E. CLAYTON:

CHAS. SCHOFIELD, Esq.—Dear Sir: Having followed the business of mining engineering for upwards of 30 years, and having had in this connection much to do with regulating machinery for saving gold and concentrating sulphurets, and having in nearly every mining camp on the Pacific Coast examined the various kinds of Ore Concentrators in use, I will say that I have nowhere seen anything half as cheap and simple in its construction, scientific in principle or effective in operation as your machine.

J. E. CLAYTON.

Machines can be Furnished at Short Notice. In all Cases we Furnish the
Concentrator Complete, Set it Up, and Instruct the Buyers as to
the Proper Way of Managing It.

ADDRESS:

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OM 59, NEVADA BLOCK, SAN FRANCISCO.

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Rolling Mill Company,

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Established for the Manufacture of

RAILROAD AND OTHER IRON

Every Variety of Shafting,

Embracing ALL SIZES of

Steamboat Shafts, Cranks, Piston and Connecting Rods, Car and Locomotive Axles and Frames,

—ALSO—
HAMMERED IRON

Of every description and size.

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The highest price paid for Scrap Iron.

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Notice.—Particular attention paid to making Superior Shoes and Dies.

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MANUFACTURERS OF

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OROSE PATENT BOILER FEEDER AND SEDIMENT COLLECTOR

Dunbar's Patent Self-Adjusting Steam Piston

PAOKING, for new and old Cylinders.

And all kinds of Mining Machinery.

Front Street, between N and O streets,
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Brass Foundry & Pump Factory.

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Sole Proprietor and Manufacturer of the

Celebrated Hudson Force Pumps, Atwood & Bodwell Windmill Brass Pumps, Smith's Copper-Lined Pumps, Plumbers' Force Pumps.

Special attention paid to Brewers', Distillers', Beer and Hot Liquor Pumps, and Wine Pumps. Particular attention paid to AIR PUMPS, also to

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Artesian Well Pumps Made to Order.

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All kinds of Brass, Composition, Zinc, and Babbitt Metal Castings, Brass Ship Work of all kinds, Spikes, Sheathing Nails, Rudder Braces, Hinges, Ship and Steamboat Bells, and Castings of superior tone. All kinds of Cocks and Valves, Hydraulic Pipes and Nozzles, and Hose Couplings and Connections of all sizes and patterns, furnished with dispatch.

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Persons engaged in the following business can have their Signs Painted at contract prices, for goods or articles in which they trade, viz:

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ENGINES AND BOILERS,

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WRIGHT'S

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COSMOPOLITAN EMERY

WHEELS AND STANDS.

Putnam Machine Company's

MACHINISTS' TOOLS and

Wood Working Machinery.

HEALDS & SISCO

Centrifugal Steam Pumps.

FARMER'S ELECTRIC MACHINE
FOR BLASTING AND HILL'S
EXPLODERS.

HASKINS' BLOWING ENGINES

For Mines.

Large Assortment of

MORSE TWIST DRILLS.



HASKINS' PORTABLE HOISTING ENGINES, constructed especially for economical use in mining districts, with Compressed Air or Steam, adapted to all classes of underground work and made throughout on the interchangeable plan, so that all parts can be duplicated when desired. Catalogues and Estimates given on application.

GOLD, SILVER AND COPPER MINING,
Reducing and Concentration Machinery.

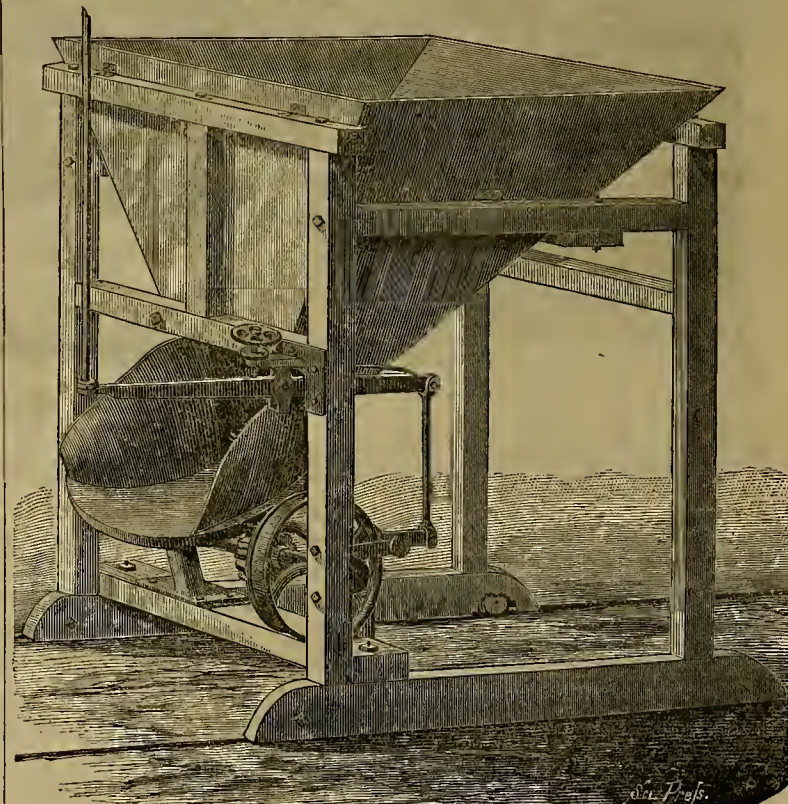
FRASER, CHALMERS & CO.
SUCCESSIONS TO EAGLE WORKS MFG. CO. MANUFACTURERS OF
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STEAM ENGINES, BOILERS AND STAMP MILLS
CRUSHING, ROLLERS, AMALGAMATING MACHINERY
FOR SYSTEMATIC MILLING, SMELTING AND CONCENTRATION OF ORES
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Address, FRASER, CHALMERS & CO., Chicago, Ill.

Hoisting Engines, Diamond Pointed Rock Drills,
Manufactured by M. C. BULLOCK.

LATEST IMPROVED
HENDY & COCHRANE'S ORE FEEDER
FOR QUARTZ MILLS.

AWARDED FIRST PREMIUM AT THE 10TH INDUSTRIAL FAIR OF THE MECHANICS' INSTITUTE.



It may be considered as now fully demonstrated, by careful and long-continued experimentation, that the plan upon which a perfect ore feeder must be constructed is that of the carrier, and not that of the shaking table. Uniform and accurate feeding is not possible upon the latter plan. The ore must be evenly carried, upon a steadily advancing plane, or table, to the line of discharge, and there simply dropped. Spasmodic or jerky contrivances will not answer the purpose.

REFERENCES.

A letter received from the Julian Mill, Newcastle, says, of the Table Feeder: "It is the most perfect Feeder we have ever seen; don't see how any mill can do without them."—A letter from Mr. C. C. Belding, of Amador County, speaks in the highest terms of them. Two of the machines were shipped to the Bunker Hill Mill, Amador County. Mr. Stevenson, of Boston Mill, Gold Hill, Nevada, says they are the best Feeder he has ever seen. Mr. Lachman, of the Southey Mill, Tuolumne County, says they work splendidly; could he have better. Two of the machines were shipped to the California Company, Nevada City. C. J. Garland, of Mosquito Gulch, Calaveras County, says: "I find them an excellent machine." S. D. B. Stewart, Supt. Lincoln Gold Mining Company, says they are a perfect success. C. C. Hewitt, Supt. Keystone Mining Company, says: "I can safely recommend them to all millmen."

We warrant the machines to give perfect satisfaction, and to be a better and more durable Feeder than any other in the market, and will sell them as cheap as any other machine of its class.

For Description, Send for Circular to

J. HENDY, Sole Manufacturer,

No. 32 Fremont St., - - - San Francisco, Cal.,

WHERE IT CAN BE SEEN IN OPERATION.

ALSO, MANUFACTURER OF

HENDY'S IMPROVED AMALGAMATOR and CONCENTRATOR,

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San Francisco Cordage Company.

Established 1856.

We have just added a large amount of new machinery of the latest and most improved kind, and are again prepared to fill orders for Rope of any special lengths and sizes. Constantly on hand a large stock of Manila Rope, all sizes; Tarred Manila Rope; Hay Rope; Whale Line, etc., etc.

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PACIFIC RURAL PRESS,

A first-class 16-page Agricultural Home Journal, filled with fresh, valuable and interesting reading. Every farmer and ruralist should take it. It is immensely popular. Subscription, \$4 a year.

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THORNE, DeHAVEN & CO.

21st Street, above Market,
PHILADELPHIA.

DRILLING MACHINES.

PORTABLE DRILLS. Driven by power in any direction, self-feed and convenient adjustment.

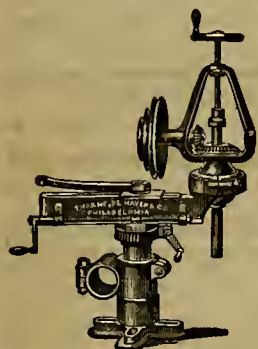
RADIAL DRILLS. Self-feed—large adjustable box table—separate base plate, every convenience.

VERTICAL DRILLS. Self-feeding—of new and improved designs.

MULTIPLE DRILLS. For boiler work, etc., 2 to 20 spindles, fed and returned by power or hand, together or separately.

HORIZONTAL BORING AND DRILLING MACHINES. For large pieces—with boring head, adjustable, vertically and horizontally.

SPECIAL DRILLS. For special work. Gun Blank Drills, Coal Drills, &c., built to order.



Giant Powder.

Patented May 26, 1868.

THE ONLY SAFE BLASTING POWDER IN USE.

GIANT POWDER, NO. 1,

For hard and wet Rock, Iron, Copper, etc., and Submarine Blasting.

GIANT POWDER, NO. 2,

For medium and easy Rock, Lime, Marble, Sulphur, Coal, Pipe Clay and Gravel Bank Blasting, Wood, etc.

Its EXCLUSIVE use saves from 30 to 60 per cent. in expenses, besides doing the work in half the time required for black powder.

The only Blasting Powder used in Europe and the Eastern States.

BANDMANN, NIELSEN & CO.,

General Agents, No. 210 Front Street.

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AUTOMATIC PUMP.

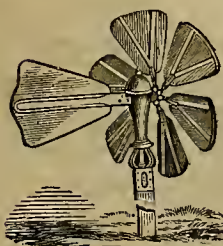
Raises water by compressed air to any height or distance. Windmill can be set at any distance from the well or spring if required to get a good exposure to the wind.

SEND FOR CIRCULAR.

J. E. HOLLOWAY, Gen. Agent for Pacific States,

31 Beale Street, San Francisco,

WHERE THE PUMP CAN BE SEEN IN OPERATION.



SACRAMENTO, May 29th, 1875.

Messrs. Dewey & Co., Gentlemen:

Yours of the 27th inst. is received. The patent came duly to hand yesterday, by express. Please accept thanks for your promptness in obtaining the same. Very respectfully,

DUNCAN BEAUMONT.

PASO ROBLES, CAL., October 18th, 1875.

Dewey & Co., Gents: The letters patent for the Tire Upsetter have come to hand. For the prompt manner with which you have brought the matter to a successful issue, please accept my thanks.

Yours Respectfully, JOHN H. MERTZ.

HERCULES POWDER.



HERCULES Slaying the Giants.

[Hercules, the son of Jupiter and Alcmena, was descended directly from the Gods. He performed more wonderful deeds of strength than any of the heroes of old. On one occasion, he was sent by Enrythens to execute a very great task, when he found himself opposed by several Giants, among whom were the powerful Giant Geryon, Enrytion, a Monster with three heads and six arms, and the two-headed dog, Orthus. All these he slew with his club. He then came to a high mountain, which, with one blow of his club, he broke from summit to base, and thereby made an entrance into the Mediterranean Sea, through the Rock of Gibraltar, the Straits of which are known to this day as the Pillars of Hercules.]

We wish to call the attention of Miners and others to a few points of the superiority of **Hercules Powder** over all other strong Explosives:

1. Its strength is greater than that of any other in use. The materials of which it consists are compounded upon strictly scientific principles, and are not a simple neutral absorbent employed that will hold a quantity of Nitro-glycerine. It is the opinion of the best chemists to whom the matter has been submitted that no mixture has been employed that so thoroughly promotes the whole tremendous force of the explosives employed, and at the same time neutralizes the offensive gases caused by the explosion. With this powder one-half the time is saved that is lost by using any other strong Powder, before you can resume work after a blast.
2. **UNIFORMITY.**—The materials of the mixture are chemically prepared, and therefore, great uniformity can always be depended upon and the best results obtained. This is a great advantage over any that varies in its strength as those must which are mixed with any natural earth.
3. **SAFETY.**—So perfect is this mixture that no accident can happen with it from premature or accidental explosion, if persons will half follow the rules laid down for its use. No Powder has ever been invented where so few accidents have happened with it in proportion to the quantities which have been used.
4. **CARTRIDGES.**—It is well known that nitro-glycerine has a tendency to decompose by volatilization. These are the "fumes" that are smelled on going into a close warm drift, or room where nitro-glycerine powders are stored. To prevent the escape of these "fumes" an almost hermetically sealed cartridge is employed, and so effectually is it, that some cartridges filled with Hercules were exposed to a blazing California sun for six months in summer, with no perceptible loss of strength. This is a great advantage over the open porous paper generally used for cartridges.
5. **ECONOMY.**—We believe that any miner who will take the trouble to investigate the matter will satisfy himself that full 15 per cent. is saved by using the HERCULES over any other strong Powder manufactured.

Query. Is this worth saving? We should think so. Try it. {Hercules X X No. 1, for extreme hard rock.
Hercules X X No. 2, for medium hard rock.

The GREAT SUCCESS of the HERCULES POWDER naturally aroused a strong opposition to its use, and litigation in defense of its rights become necessary. We would therefore call the attention of the public to the FINAL DECISION in the U. S. Circuit Court of the whole matter in favor of the California Powder Works, *which explains itself*:

DECISION OF THE COURT.

At a stated Term of the Circuit Court of the United States of America of the Ninth Judicial Circuit, within and for the District of California, held at the Court Room thereof, in the City and County of San Francisco, on Wednesday, the sixth day of October, A. D., 1875.

Present:—Honorable Stephen J. Field, Associate Justice of the U. S. Supreme Court; Honorable Lorenzo Sawyer, Circuit Judge.
THE GIANT POWDER COMPANY vs. THE CALIFORNIA POWDER WORKS, Et AL., *In Equity*, No. 1,233.—The Court having, on the 22d day of September, A. D., 1875, being a day in the July Term, A. D., 1875, of said Court, sustained the demurrer of the defendants to the complainant's amended Bill of Complaint herein, will leave to complainant to amend its said bill on or before the next succeeding rule day, and the said time granted complainant within which to amend its said bill having expired, and the default of said complainant to amend its said bill having been duly entered, and the Court having on the sixth day of October of the said term and year, on motion of C. R. Greathouse, Esq., Solicitor for defendants, M. A. Wheaton, Esq., Solicitor for complainant, being present, in open Court, and declining to amend his said bill of complaint, he having elected to abide by his said bill of complaint as filed in this cause, ordered that a decree be entered herein dismissing said bill.
Thereupon, upon consideration thereof, it is ordered, adjudged and decreed, that the complainant's said bill be, and the same hereby is dismissed, and that the said complainant pay the said defendants their costs in this behalf expended.
October 18th, 1875.

(Signed) LORENZO SAWYER,
U. S. Circuit Judge Ninth Circuit.

L. S. B. SAWYER, Clerk.
By J. F. O'BRIEN, Dep. Clerk.

ENDORSED:—Filed and entered, October 18th, 1875.

Sold by THE CALIFORNIA POWDER WORKS, 314 California Street, San Francisco, Cal.

Also, all grades of Black Powder, Fuse, Shot, Caps, Etc.

MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO.,
Patent Solicitors.

SAN FRANCISCO, SATURDAY, MAY 27, 1876.

VOLUME XXXII
Number 22.

A Favorable Report.

It is with satisfaction that we lay before the readers of the PRESS the report of Mr. Knox, who was sent out by the Advance silver mining company for the purpose of giving their mine a thorough examination. Mr. Knox, after submitting the mine to a thorough inspection, reports as follows:

To the Directors of the Advance silver mining company.—Gents: At your request I visited and carefully examined the mine belonging to your company, on Monitor mountain, Alpine county, California.

I found on the property about 900 feet of tunnels, three or four short cross-drifts and two shafts. Shaft No. 1 is the working shaft. It was, when I was there (April 26th 1876), 195 feet deep, and entirely in hanging wall rock (propylite.) Shaft No. 2 is near the extreme west end of the tunnel, on what is called the foot wall, and is about 150 feet deep. The last 70 feet in depth of this shaft contains excellent concentrated ore—black sulphurets of silver, with traces of zinc blend and copper. This shaft is about 550 feet northwesterly from the working shaft, and the pay chute about 15 feet thick, solid.

I am confident that the true west wall of the vein has not yet been reached by the northwesterly drift, but as far as developed the vein is over 400 feet thick. The concentrated ledge or the hanging wall, as prospected by the drill, is at least 30 feet thick of excellent milling ore. The hanging wall, immediately in contact with the east vein, is a porphyritic quartzose rock, or propylite of considerable thickness, backed up by a solid formation of blue trap rock, of over two miles in thickness. The west or foot wall is supported by the same material as far as explored, and this by blue trap extending far to the west. I could not tell how far, the snow in that direction covering the mountains. The opening in the trap rock through which the vein protrudes, extends in a northerly and southerly direction for at least 12 miles. The "blossom" or outthrow from the vein is enormous, extending some two miles in length and nearly one mile in width. It has never been my fortune to see anything that compares with it in magnitude.

This outcrop is of no practical value, but demonstrates the great size and strength of the vein. The vein has never been explored to any depth, where it might be expected to become solid in its formation, but this is being done as rapidly as possible by the working shaft. At the depth of three hundred feet, the shaft will cut the east wall of the east vein, from which good milling ore can at once be extracted.

I should perhaps mention that in the "blossom" from the vein, very rich pockets of ore, principally sulphurets of silver and iron, have been found, varying much in size, some containing a few pounds and some many tons, each pocket entirely isolated from the other, and giving no indication of their position except by actual contact. This goes to show that when the true vein is reached, rich ore will, without doubt, be found in it. Experience in the Comstock lode confirms this opinion. Another point which indicates the early concentration of the vein, is that the outcrop or blossom rises nearly 1,300 feet above the level of the top of the working shaft.

Yours truly,
ISRAEL W. KNOX.

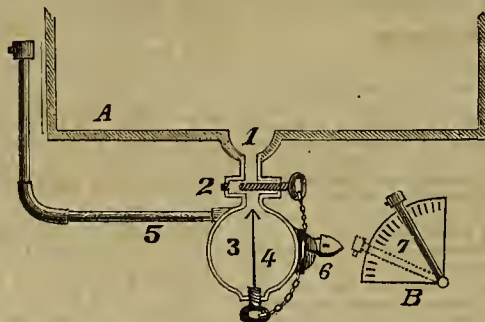
THE "FOURTH" MORE GLORIOUS THAN EVER. It is plainly to be seen that the determination to make the approaching anniversary of the Declaration of American Independence more glorious than ever, is not limited to our own State. From all quarters we hear of these extra notes of preparation, proving that the large portion of American patriotism which was not enabled to attend the Centennial will keep the great holiday in a proper manner at home. In many places arrangements are being made to devote three consecutive days to the celebration. The preparations, so far as we have been informed, are in good taste and the proper spirit is infused into the whole matter. It is safe to at least predict an unusually "Glorious Fourth."

SCHOOL VACATION.—A six weeks' vacation of our public schools commenced on Saturday of this week. The pupils are reconciled.

King's Patent Galley Supporter.

The engraving illustrates the working of a patent designed to save a large amount of time and trouble for printers. The "supporters" are metal castings, forming a straight grooved piece between two parallel pieces, disposed at the ends and at right angles thereto. The groove in the central portion and notches in the cross piece fit over the transverse partitions of the case, and the galley rests against one cross piece while the other presses against the longitudinal partition or edge.

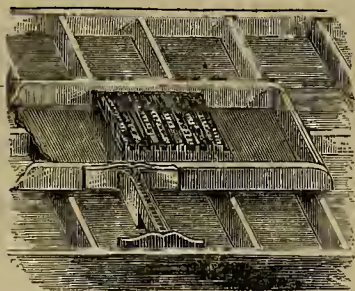
This patent, when placed in position on the lower case, prevents the galley from covering the lower tier of boxes and the compositor has free access to every box in the case, without having to lift or disturb the galley at all. Without the "supporters" the galley cannot be placed on the case without covering a number of the letter boxes, and must be lifted every time a letter



PAUL'S PATENT AMALGAM SAFE AND MERCURY DISCHARGER.

is required from the boxes so covered, thus necessitating a waste of time and labor that would repay its value daily. Practical printers will readily understand and appreciate the convenience of this invention and profit by the ingenuity of the inventor.

K. S. Johnson, 43 and 45 Powers street, Brooklyn, E. D., New York, has become sole proprietor of this patent. We are informed they are now in daily use in the largest printing establishments in New York city, and are acknowledged to be an indispensable acquisition to the trade. They are retailed at 50 cents per pair, and will save that amount daily to every compositor using them. State and county



KINGS' PATENT GALLEY SUPPORTER. rights to sell or manufacture can be had on application to the proprietor.

COAL AT SANTA ROSA.—A correspondent writes us from Santa Rosa that Mr. C. W. Frost discovered during the past winter "a first class cannel coal mine" in the mountains of the adjoining township, with a vein 12 or more feet wide, and of an unknown depth. A company has been formed, of \$10,000,000 capital, to develop this mine, and also, probably, to run a new railroad in connection with it from Santa Rosa to San Francisco.

The miners who left for the Black hills are returning daily, declaring that the new El Dorado is a fraud, not only as regards gold but in the matter of timber.

Paul's Patent Amalgam Safe and Mercury Discharger.

The accompanying cut exhibits this new device for "cleaning up" pans or settlers and securing amalgam, lately patented through our agency by the well known inventor, Mr. Almarin B. Paul, of this city. It is adapted to all kinds of amalgamating pans or settlers, and can be applied at a very trifling cost. By it all amalgam is absolutely under control of the superintendent, and beyond the inspection of any party not duly authorized.

Explanation of Cut.

A represents pan or settler; Fig. 1 is a bowl on outer edge of settler or pan; Fig. 2 represents a screw, which closes the connection between safe and vessel, when it is desired to take out amalgam; Fig. 3 represents the safe, where amalgam is deposited by gravity; Fig. 4 is a guard, which prevents abstracting

amalgam by any device; Fig. 5 is a pipe with adjustable joint, through which all mercury free of amalgam passes out for re-use; Fig. 6 is a lock, which prevents the opening of the two points of discharge; Fig. 7 is a dial, which is used to regulate the flow of mercury. The whole operation is based on the specific gravity of water, ore, mercury and the precious metals, and is as exact and certain to operate as the law of gravity itself. It will thus be seen that the arrangement is such that the mercury can be retained in the pan or settler as long as desired for amalgamating; and at will the pan or settler, or fifty pans or more, can be practically cleaned up in a few minutes, without stopping machinery. The mercury carries the amalgam to the safe, then passes on, freed of it, to a receiver for re-use. The safe and mercury discharger is one of the appendages to the "Paul Process." There are several of these machines in practical operation, and all give the most complete satisfaction. This cut represents the attachment to a pan. By a very simple change they can be connected to sluices in hydraulic mining, and so be arranged as to not only be a safe, but answer a purpose as a depository of the gold and securing it beyond further danger of washing off. They are made of capacity to hold from \$500 to \$10,000 of gold amalgam.

The time saved in cleaning up pans must make this a valuable addition to our mining machinery, and is one more item to that grand ultimatum of extracting the precious metals without stopping machinery or extra handling of anything. Mr. Paul's address is Room 20, Safe Deposit building, San Francisco.

ANSWERS TO CORRESPONDENTS.—"J. H. S.," Miners' foundry. The specific gravity of water being equal to 1, of course anything will sink in it the specific gravity of which is greater than 1, such as the articles you mention. Wood, although its gravity is in most instances greater than 1, swims, because it is porous, but when these pores become impregnated with water, it will also readily sink. Convince yourself by experiments.

THE State of Oregon has received from the General Government 90,000 acres of public domain for the purpose of establishing an agricultural college.

Gems and Precious Stones.

[Written for the PRESS by HENRY G. HANKS.]

(Continued from last week.)

B.—Sapphire, Asteria or Star Sapphire, Oriental Amethyst, O. Emerald, O. Ruby, O. Topaz.

The red sapphire is the true oriental ruby, and is the most valuable of all gems; even more so than a diamond of equal weight. The first specimens came to us from Ava in Siam. They are also found in Ceylon. The mines of Burmah are the most productive. The rubies are found by sinking shafts and washing the stratum in which they lie with water. The stratum is of unequal depth, sometimes being found near the surface while at others it is not found until a depth of 30 feet is reached. These mines belong to the Government and no European is allowed to approach them on any condition.

The color of the ruby is not always constant, being found from a bright red to a deep crimson. The peculiar tint known among connoisseurs as pigeon's blood is the most esteemed.

The blue sapphire is the next in value; perfect stones of this color are very rare. It is remarkable that generally the stone is not uniformly blue, and great care is required in cutting it to good advantage. A perfect sapphire should appear the same tint of blue by candle-light as by daylight, which is seldom the case. That peculiar blue, formerly called *bleu du roi*, which resembles the blue of velvet, is the most sought.

The yellow sapphire is called the oriental topaz; when of good color is very valuable; it is brilliant, and is often taken for the yellow diamond. It is usually found of a light straw color, when it is not so highly valued.

The oriental emerald is thought to be the rarest of gems. One of the most eminent jewelers in Europe says that he has never met with but one specimen.

The oriental amethyst is a sapphire which has a purple color. It is far more brilliant than the common amethyst, and is a charming gem which is greatly prized; it may be distinguished from the amethyst by its superior hardness.

Some sapphires show a star when held in a strong light and in certain positions; star sapphire, asteria and oriental glass are different names for this gem.

The sapphire is cut in much the same way as the diamond, and the lapidary has often the opportunity of showing his skill in cutting this gem, to remove the impurities of the blue variety and to display the natural beauty of the asteria improved by his taste and skill.

In setting the sapphire, colored foil is generally placed under the stone to lighten its color, the foil being in every case that which it is desired the stone shall be. The proper use of the foil requires much skill and judgment. The temptation to imitate the sapphire is so great that great care should be taken to ascertain the genuine character of a stone when about to purchase. Not only are other inferior stones, yet to be described, substituted for the sapphire, but a glass or paste imitation is often found in commerce. The hardness test will always detect this counterfeit.

(To be Continued.)

PLATES COATING WITH VERDIORIS.—"Many Miners" desire to be informed concerning the best method for preventing the coating of the copper plates of quartz mills. We would inform them that different mills use different materials. Some use sodium amalgam, which can be bought of any first class druggist, ready prepared for spreading on the plates. This is perfectly harmless. Others prefer cyanide potassium. This also can be had of the druggist ready for spreading on the plates, but it is a deadly poison, and should be so marked, and our friends should be careful what hands they trust it in.

JOINT TARGET EXCURSION.—Company "F," Capt. J. E. Hughes; Company "H," Capt. H. P. Bush, and Company "D," Capt. R. H. Horton, of the First Infantry, National Guard of California, Major David Wilder, Commander Battalion, held their annual target excursion and picnic at Esplanade park, Marin county, on Thursday.

Mount Hamilton.

The site of the Lick observatory—to be built from the donation of \$700,000, by James Lick, of San Francisco, is on the crest of the above named mountain. Its elevation is 4,350 feet above the sea level. It is distant, south-easterly, from San Jose, a trifle over 25 miles by road, and perhaps 18 miles in an air line.

Last week, by the kindness of our excellent friend, Mr. S. P. Sanders, landscape photographer, of San Jose, we made a very enjoyable trip to the summit of this soon to be famous mountain. Following the grand avenue, leading to Alum Rock, four miles, we come to Lick avenue, branching off to the right and extending to the very pinnacle of Mt. Hamilton. The maximum grade is one foot in sixteen. When finished it will be entirely macadamized, and a "spanking team" can be driven at good speed over the entire route. Gradually rising the hills which overlook the San Jose valley, we pass over the ridge into Hall's valley—a magnificently appearing meadow at this season. Then we climb a higher ridge, overlooking valleys and ordinary mountain tops, and with a slight descent enter a delightful glen, through which passes Smith creek—a sweet water river as clear as crystal. This place is seven miles from the summit by the grade. We reached it by trail in less than four miles. Below, the views are delightful and grand, but approaching the summit they rise almost to sublimity. The gradual winding upward by the road will afford the tourist a scene of lingering enchantment. Crossing the breast of the mountain in five zigzag lines, the road gives a final sweep around the crown, bringing the traveler upon the very crest of the pinnacle, unfolding to him in the near foreground mountains of little less magnitude but equally grand and bold, and in the distance, east and west, the larger valleys, the ocean, and the Sierra Nevada. The ever-varying hills and valleys are at this season of the year rendered more than usually beautiful by their green and brilliantly flowered covering. A few rods east of the highest pinnacle is a point of very perfect echo, which will afford much interest to visitors. Easy of access, just northerly, are other peaks which will also attract attention. We do not believe the people of San Jose are yet aware of the importance of their public spirit in constructing this grand and free highway to the hill of science that the God of nature so kindly set up and Mr. Lick has so grandly brought to light upon the very borders of their beautiful garden city. Of all the noble bequests made by James Lick, none, we believe, will ever afford his name so many pronounced blessings as the work here-mentioned.

Several miles of the road are yet to be completed by the contractor, Mr. Derby, who has to his credit pushed his work forward with great zeal. A grand Centennial Fourth of July celebration, would not be inappropriate on the completion of the Lick avenue.

As we are personally informed of the manner in which Mt. Hamilton received its title, we would here add that it was named by Prof. W. H. Brewer, of the late State geological survey, after his intimate and personal friend, Rev. L. Hamilton, of Oakland. Prof. Brewer, while stopping at San Jose with Mr. Hamilton, invited the latter to accompany him on a geological excursion, during which Mr. Hamilton was the first of the party to visit this mountain, leaving marks of his visitation. Mr. Hoffman, of the surveying party, now in this city, will verify this statement.

How to Have Warm Water.

The luxury of warm water constantly on hand in large quantities is something which our readers do not often enjoy. The method of securing it which is generally in use in city houses is expensive, and any contrivance which will cheapen the luxury and place it within the reach of thousands of homes, we conceive to be a public benefit. For this reason we quote for our readers a paragraph which we find in the *Los Angeles Express* of recent date, as follows: "We examined an invention this morning at Swigart & Huber's which is destined to create a revolution in heating water in houses for the use of the kitchen and the bath. The inventor, Mr. James T. Stewart, who is a workman in Swigart & Huber's, explained to us the principles of his invention, and we are disposed to think that he has really evolved a most magnificent problem in the economy of housekeeping. His invention consists simply of a section of copper pipe which fits on the flue of the stove. It is filled with tubes, through which the smoke and heat arising from the fire pass. The water is conveyed by means of a pipe from a tank, which may be located on the roof or in the attic. This connects with the tubular section, and the water in passing through it becomes heated, then passes into another pipe and ascends to the tank. As the hot water is drawn off, fresh water enters the tank from another pipe, which is supplied with a self-adjusting valve. Thus the water in the tank is kept constantly at the same level, and as it is continually circulating to and from the tubular section, it is maintained at a temperature of heat consistent with the degree of fire in the stove. The tubular sections are made to suit every sized stove, and as the tubes, although of copper, are fitted on the side next to the water,

they are very strong and there is no danger from verdigris. By this simple apparatus any house can be supplied with hot water at all times. A small family can be accommodated with this desirable element just as well as a large one. It does away with the cumbersome coils of pipes which are required by the old method, avoids the necessity of an expensive copper boiler, and places the poor man's house on an equality with that of the rich as regards the luxury of heated water. The entire outfit will hardly cost as much as an ordinary heating boiler such as is now used in connection with the ranges. The water tank may be of wood, and need cost but a mere trifle, and the pipes leading to and from it may be placed in a house at a very moderate figure."

The Corning Tunnel, Colorado.

We condense the following facts concerning the mining and milling operations of the Corning tunnel company from the *Boulder (Colorado) News*:

The mill is being erected by the Left Hand creek, directly below the mouth of the tunnel which is being driven through Gold hill. The new buildings are a framed house over the mill, 36x64 feet, with shed additions around, furnishing room for offices; a boarding house, 30x44 feet, and stable, 30x30. The main mill building is made large enough to cover 40 stamps. Fifteen only will be set up at first. The veins so far cut by the tunnel yield free gold ore, soft iron and copper pyrites, and the process of treatment adopted is the simple one ever found most profitable in this country. The harder rock will first be broken by jaw crushers, thence fed into the batteries of the common stamp mill, using the common amalgamating tables, only that the copper plates for this mill have a coating of silver, regarded as an improvement. What gold escapes amalgamation in passing over these galvanized plates goes off with the tailings, and these are to be concentrated.

A 60-Horse Power Engine

Is provided to drive the machinery. And as soon as the company feel warranted in making the additional outlay for a turbine wheel, they propose to use water power, except during the colder winter months. Wood at the mill costs only \$2.50 per cord, so that steam is not costly. The country around is well wooded, and it will be a long time before there is a scarcity of fuel.

The Bonanza

is the name given the great vein last caught by the tunnel, 600 feet in. This vein of ore is being developed for supplying the mill, or, rather, the mill is erected to make available the ore brought to sight in this mine. The Bonanza vein is cut at a depth of about 400 feet from the surface of the ground. Eastward on the Bonanza the drift extends 200 feet, disclosing a continuous pay, varying very little from an even width, the average thickness of the vein of mill ore being about three feet; or, to be more exact, the variation is from two feet and four inches to three feet and six inches. West the Bonanza drift is run 140 feet, in which there is 25 feet of barren ground—the remainder being much the same as east, with pay in the breast of the level. No Colorado mine has yet developed a better showing for ore.

Will it Pay?

To satisfy themselves of this, they had 75 tons run last year, in a little old stamp mill on the creek. The result was satisfactory. The new mill is being constructed with the view of making the most of a large bulk of ore of low grade. It is well known that in California and Australia free gold quartz that yields \$10 per ton is made to pay handsomely. This is done by figuring closely, and seeing to it that the practice meets the figures. The ore brought to sight in these large Corning tunnel veins ought to pay if it yields no more than \$10 per ton.

The Corning tunnel was started by men who had in view the conduct of a mining scheme in a sensible and systematic manner. Most failures of mining enterprises in this country are due to the building of mills before having ore to run, and doing business generally wrong end foremost, so that expenses outrun all estimates and all reason. This is the rock on which they split, and the rock avoided by the Corning tunnel company. This mining enterprise may be run as closely to estimates of costs as an Eastern cotton factory, or any other regular business, and that gold mining is not gambling, nor simply a venture, but a legitimate business, based on solid foundations, and to be perpetually and systematically pursued.

The Future of This Project.

The Corning tunnel is designed to channel entirely through the hill, a distance of a little more than a mile. Its course is from the north to the south, across the course of the veins, in order to disclose the whole metallic wealth of the mountain. It was here that the tellurite lodes were first discovered, and many of the richest of the class course the hill. These will be caught as the tunnel progresses. In time the mines opened by this tunnel must give employment to thousands of men. Eventually all the levels will be run, and even the stopping done, by machine drills. The day is not far off when the whole process of mining and milling ores in this country will be so economical and systematized that rock holding the value of \$10 per ton will become profitable, and grades much lower be available for concentration. It is difficult to comprehend now what value will then be put upon such property as the Corning tunnel.

A Miniature Quartz Mill for the Centennial.

There has recently been constructed at the Union iron works in this city, says the *Sacramento Record-Union*, a miniature quartz mill and a set of mining machinery, which is soon to be forwarded to the Centennial exposition at Philadelphia, and to be exhibited in the chief cities of the East and of Europe. The machinery, which is now exposed in front of the corner of Front and O streets, is sufficiently attractive to awaken the interest of the dullest, and in its beautiful miniature proportions causes the ladies who view it to declare it is "just the cunningest little thing." Probably a thousand people have called to see it within a week. It was built for a joint stock company consisting of John Reardon, Nelson Wilcox, William Atkinson (of Amador), S. S. Spencer, W. H. Doane and Mr. Farrier. The entire machinery is a perfect model of the largest and most elaborate quartz mill in this State, and is just one-third its size. It occupies a space 14 by 16 feet, and is so constructed that it can be taken apart and packed in its cases in 15 minutes, or taken from the boxes, set up and put in motion in 30 minutes. First is the horizontal engine, which is mounted on a miniature locomotive boiler and fire box four feet six inches, by two feet in size, which, in turn, rests upon a wheeled truck. The engine bed is two feet long, and the engine itself, though but four inch stroke and three inch bore, is as perfect and complete as the largest, having every appliance and attachment used in the heaviest engines. Its nominal capacity is two and a half horse power, and it is finished up elegantly, with polished surfaces, a walnut jacket to the cylinder, silver gauge and spring-hall governor, and weights, with boiler, fire box and truck, but 700 pounds. Next to the engine stands a Wilson amalgamator, one-third the usual size, and beside it the best pattern of settler and three settling tanks.

Lastly comes the quartz mill. The mill is mounted in hack walnut and California laurel frame, oiled and polished, and is in two sections of two batteries each, five stamps to the battery, or 20 stamps in all. Each shoe weighs 30 pounds, has three inches drop and a three inch face. Each mortar is 19½ inches long and has No. 60 wire screens 2½ by 16 inches each. All of the stamp rods are polished, and the rough iron work neatly painted. The upright frames between which the stamp rods play are made of heavy black walnut beams with cross guide beams of California laurel. These upright frames are in two sections and are set into the bed frame, held by wooden keys and braced by hog chains tightened by swivel stirrup links. To loosen the latter, knock out the keys and lift a section to its packing box is but a moment's work. The mortars and dies are of cast iron, the former being fed from the back the same as in the larger mills. Nest black walnut hinged levers serve to lock the stamp from dropping when cleaning up time comes. All the usual rifle boxes, water feeds, pumps, troughs and other attachments of a first-class quartz mill are to be found in front of the mortars, the troughs and boxes being copper bottomed and very neatly finished up. The entire weight of the mill, pans, attachment, engine and boiler, will not exceed 5,000 pounds.

This mill is capable of crushing from one to two tons of stuhhorn rock and passing it through all the processes in a few hours of work, according to the claim of the company. With the mill a cabinet of California and Nevada ores will be taken on, and several tons of silver ore and gold quartz. It is the intention of the company to regain the money they have expended in its construction by exhibiting the full process of reducing ores as practiced in California and Nevada quartz mills. It is also intended to use the mill as prospecting and test machinery, as it can be transported to almost any locality at a small cost, and will do its work as thoroughly as the large mills. It is intended to have it in operation in Philadelphia by the first of July, after which it will be taken to the chief cities of the United States, and then across the Atlantic, but will be returned to Sacramento by this time next year. Mr. Reardon will be working exhibitor of the machine, and Messrs. Wilcox & Doane business managers. Prior to leaving for the East the mill will be set up on J street and exhibited here, this being in compliance with the request of a great number who have seen it in the shop, and desire to witness it at work. As a specimen of mechanical neatness it is a most creditable exhibit for the Union iron works, and as a lively exhibition project it is sufficiently venturesome to warrant the wish that its projectors may succeed.

ANOTHER MILL COMING.—The *Boulder News*, speaking of the North Boulder silver mill says: The operation of this mill forms an advance step in Colorado mining. It demonstrates that low grade silver ore may be profitably worked by a mill the first cost of which need not exceed \$20,000. The wealth of the mines is in the low grade ores, and by this process they may be worked to profit. It is not only a very economical process, but the machinery is not liable to get out of order, and the extraction of the silver is very close. It is the purpose of Superintendent Cash to erect a mill of this kind at Georgetown.

The road to Yosemite valley is now open via Chinese Camp, and passengers can reach the valley from Stockton in 34 hours. The Centerville and Yosemite road is also open.

Protecting Steam Pipes.

In our issue of March 11th we described a covering for boilers, used in Germany, which resembles that used at the San Jose mines, Egan canon, Nev., the latter of which a correspondent describes for us as follows:

Take pulverized clay from the gouge of the vein, two parts; sifted wood ashes, one part. Wet and mix to the consistence of plastering mortar, with common flour paste made pretty thin, adding plastering hair or any short fibrous material such as old hoisting rope chopped into lengths of one inch or thereabouts. Apply this mortar in one or more coats of say half an inch in thickness. It will adhere well, and harden quickly from the heat in the pipes. A coating about three-quarters of an inch thick applied to a three inch steam pipe 420 feet long, 60 feet of it horizontal, 30 feet of vertical, and the remainder going down a main incline at angle between 50° and 60°, up which was circulating a strong draft when the cold was from 10° to 35° below zero, so effectually prevented cooling of steam at 400 feet from the generator that the steam was only two pounds lower at the pump than at the boiler. Of course pulverized asbestos or other more non-conducting material would serve, in lieu of what we used, a better purpose.

Mining at Magnolia.

A correspondent of the *Boulder News* writes from Magnolia, Colorado, as follows:

This is a lively mining camp and is growing more so. Day by day brings new arrivals. People from Georgetown, Central, Boulder and elsewhere are seeking to share with the earlier settlers in the harvest of rich gold ores which everybody acquainted with the district concedes to exist. Prof. Weiser, of Georgetown, is here. He states that he never saw such rich ores before. Those sought for are of the tellurite class, varying from calaverite to sylvanite, with all the intermediates. The veins are many of them immense, but the larger ones generally carry lower grade of ores than the smaller.

The mine just now occasioning most excitement is the Kit Carson. It is a splendid strong vein, with a well defined crevice 18 inches wide, showing a good deal of sylvanite and perhaps some calaverite. This lode has a history similar to many others. One person after another laid claim to it, each in turn showing a little work, and then leaving it for somebody else who had more faith to enter after the claimant's sixty days had expired.

New lodes are being struck daily, and some look extremely well. Prospecting has been extended as far as Coal creek, and is reported to have been attended with success.

AFFAIRS AT LITTLE COTTONWOOD.—A correspondent of the *Salt Lake Tribune* writes as follows from Little Cottonwood, Utah: The weather is warm and delightful, and the beautiful snow is fast melting away, only about five feet remaining, and on some of the most exposed points Mother Earth is beginning to put in appearance. The roads are in bad condition, and but little ore is being shipped, but that difficulty will be soon overcome; and the tramway will be in operation by about the 20th of the present month. It is now opened up and cars running within two miles of this place. Mr. Goss has a large force shoveling out the remaining distance. The tramway will do a rushing business this season, and it is certain the ore shipments will be nearly double that of any previous summer since Cottonwood has been known as a mining camp. Business is looking up, and all anticipate booming times this year. Our merchants are laying in heavy stocks, and are fully prepared to supply the demand, let it be ever so heavy. The mines are considerably troubled with water from the falling snow, but a few more weeks of warm weather and that difficulty will be over. Then look out for lively times, as the mines never looked as favorable as at the present time.

THE C. & C. SHAFT.—The C. & C. shaft will soon have attained the depth at which the drift for the 1500-foot level of the bonanza mines is to be started. The station for this connecting drift will be opened at the depth of 1,273 feet, and they are now within 12 or 13 feet of this point. In about a week they will be ready to begin opening the station. When the station is completed they will start a drift from it to connect with the drift now being run from the 1500-foot level of the California. This last drift is already well out toward the shaft. In the large room in the basement of the hoisting works, where stands the big pumping engine, a foundation is being laid for an air compressor. The compressor is on the ground and the foundation is almost completed. A new cylinder is shortly to be added to the big pumping engine, which will greatly add to the present power. The new cylinder will be placed behind that now in use, and the piston will work through the first into the second cylinder. Much heavy work is being done at the C. & C. machine shop. All the old shafting of the Consolidated—that is, all that is found to be sound—is there being worked over.

THE new machinery at the Consolidated Virginia for hoisting mining timbers upon the cages is found to work to perfection.

THERE is a good supply of water in the Carson river, and the mills are running on full time.

MECHANICAL PROGRESS.

How an Ocean Cable May be Broken.

Now that ocean cables have become matters of general interest and a break in one is a public annoyance, it is well to know a few points of the ease with which these threads of civilization may be snapped asunder. The report of Sir W. Thomson and Mr. Bramwell on the repeated breakages of the Direct company's cable suggests some very startling possibilities in connection with the new industry of cable breaking, which has been so rapidly developed. The report shows that the process of severing an ocean cable in 80 or 100 fathoms of water is very easy. A schooner of 80 or 100 tons has only to drop overboard an anchor or grapnel, to which is attached a stout Manila rope, and with a wind that will enable her to cross the track of the cable at a speed of five or six knots, the force thus applied is sufficient to sever the strongest cable without raising it to the surface. It is evident that this could be done in such a way that only the skipper and one or two besides would be in the secret. It is also clear that a small steamer, well handled, would do the work far more effectually than a sailing vessel. In this way the cable of the Direct company has been broken four times in six months, and as yet the dastardly scoundrels who have done the mischief have not been detected. It is believed that

A Ring of Speculators

On the Stock Exchange in New York, having confederates in London, are at the bottom of it. Their plan is to purchase Anglo stock when low, and on the breaking of the Direct cable an immediate rise follows and a handsome sum is pocketed. Let us now suppose that, emboldened by success, these speculators should resolve to operate on all the cables which connect America and Europe, what gigantic fortunes might be made by skillful manipulators who knew that at a certain date telegraphic communication between the two hemispheres would be cut off.

How the Work is Done.

All doubt has been set to rest as to the causes of these breakages, by the report of Sir W. Thomson and Mr. Bramwell. After a most careful examination of the fractured ends, which were taken up, these gentlemen declare that "these breakages were not due to any decayed or imperfect condition of the cable, and also that they were not due to the chafing of the cable against a rock, or to any influence of an abrading or of a crushing character, but that the breakages have occurred in a perfect cable, and through thoroughly sound metal, and have been caused by the whole having been torn asunder under a violent tensile strain." They pronounce the cable to be in as good a condition as when first immersed in the sea, and to be of a very strong description. Further, they declare that no fishing schooner, dragging her anchor, could have sufficient force to break the cable, and that even if raised by an anchor it would not be broken." But, in reply to the question whether the cable could have been broken on purpose by a sailing vessel, they say: "The fishing vessels' cables are certainly strong enough to break the electric cable, if, as we are informed, they are from seven to nine Manila rope, as the breaking strain of seven Manila rope is as much as 14 tons. Thus their tackle is in itself sufficiently strong, and it seems to us clear that with wind enough to render a speed of five or six knots attainable by sail, a sailing vessel of eighty tons could, if handled for the purpose of doing so, break the cable without lifting it to the surface, and that with a steam vessel so handled, the operation would be still more easy." It is quite time that this dangerous pastime were ended and this noble breaking ring brought to justice.

GAS-MADE IRON.—Ironmasters in Staffordshire do not regard it at all as a promising feature in relation to the future of their trade with the United States, that the ironmasters of Pittsburg are making arrangements for increasing the supply of well-gas to be used as fuel in the working of their mills and forges. As is tolerably well known, Messrs. Graff, Kennett & Co., with some few others, are already using fuel of that class brought to Pittsburg from wells many miles off. It now transpires that about 20 iron-making concerns have formed themselves into a company, with a capital of \$200,000, to convey to Pittsburg the gas of the Burns and the Delamater wells, in Butler county. This project means the bringing of the gas a distance of 35 miles. At one time it was thought that difficulties almost insurmountable would be found in overcoming the frictional resistance due to so great a length of piping. In this case it is proposed to meet the difficulty by increasing the capacity of the pipes from seven inches for the first seven miles to 12 inches in the last seven. If, after this, the pressure should not prove sufficient at Pittsburg, then it has been resolved that pumps, similar to those used on the oil lines, shall be placed at intervals along the 35 miles. The line of pipes will cross the Allegheny river at the Sharpsburg bridge, and extend along the line of the Allegheny Valley railroad to the city.—*American Manufacturer.*

The Fish Torpedo.

The Whitehead or fish torpedo, says the *London Times*, is the object of continued study and experiment at the Royal Arsenal, Woolwich, and other places, in order to further increase its powers, and to construct devices to resist its attack. With the improvements contrived since it has been in the possession of the government, the torpedo boat can be set to run a straight course of a thousand yards under water and explode on striking its object; it can be arranged so as to half cook or full cook its trigger when approaching the object at which it is directed, and to rise near the water line or sink to the keel of the enemy's ship, as may be desired. If it misses its aim, a safety pin is released, and the torpedo goes quietly away, to be recovered at any future time. Its attack, however, could, it is thought, be effectually guarded against by surrounding the threatened ship with a strong net about 100 feet from the hull, and this difficulty, which is not very great, is now being faced. The weakest point of the instrument is, that being propelled by an air engine the speed naturally decreases with the decreased pressure in the air chambers, and although a very high rate of speed is insured throughout the entire journey, the pace is the least at the extremity of the course. There does not seem to be any help for this, but various experiments are being tried to reduce the weight of the torpedo, and by that means obtain increased velocity. It is also in contemplation to make a considerable reduction in the amount of the charge. Recent experiments have effectually proved that a few ounces of gun-cotton, when fired in contact with an object, will exercise an effect far more destructive than a much larger quantity placed at a few yards distance, especially in water; and provided the torpedo struck a fair blow upon the sides of a ship, it would make little difference whether it contained 500 pounds of gun-cotton or 50 pounds for either would burst the sides of the thickest armor-plated ship. What is wanted is a rate of speed which will tear through the enemy's network and a store of energy at the end of the race for another encounter.

ANOTHER SMOKE CONSUMER.—Mr. Benjamin Purnell, of Birmingham, Eng., has just discovered a very simple and yet ingenious mode of securing the consumption of smoke in steam boiler furnaces. His invention is applicable to all steam boilers, and it provides for boilers consuming their own smoke, without the aid of any elaborate apparatus. Just above the fire door of the boiler he bores a couple of circular holes of about two and a half inches diameter, and inserts two pipes, which run at the top of the furnace for about one-third or half its distance. A small pipe connected with the boiler drives a jet of steam into each of the pipes, which thus creates two strong drafts of air. This air is rarified by the steam, and is driven right into the center of the flame and smoke from the furnace, thus precipitating the carbon and preventing its escape in those dense clouds which cause such nuisance in large towns.

RAILWAY SPEED.—The following are the highest authentic instances of high railway speeds with which we are acquainted: Brunel, with the courier class of locomotive, ran 13 miles in 10 minutes, equal to 78 miles an hour. Mr. Stirling, of the Great Northern, took, two years back, 16 carriages 15 miles in 12 minutes, equal to 75 miles an hour. The Great Britain, Lord of the Isles, and Iron Duke, broad gauge engines on the Great Western railway, have been run with four or five carriages from Paddington to Didcot in 47½ minutes, equal to 66 miles an hour, or an extreme running speed of 72 miles an hour; the new Midland coupled express engines running in the usual course have been timed 68, 70, and 72 miles an hour. The 10 A. M. express on the Great Northern, from Leeds, we have ourselves timed, and found to be running mile after mile at the rate of a mile in 52 seconds, or at 69½ miles an hour. The engines used are Mr. Stirling's outside cylinder bogie express engines, the load being 10 carriages.—*The Engineer.*

A WOODEN WATCH.—We were shown yesterday, by engineer Matt Franklin, a wooden watch made by Victor Doriot, of Bristol. The case is made of brier-root, and the inside works, all except three of the wheels and the springs (which are metal), are of boxwood, while the face is made from a piece of the shoulder-blade of a cow, which was run over by a train and killed some time ago. It is an open-faced watch with a glass crystal, and is an elegant piece of workmanship, displaying wonderful talent in the maker. It does not weigh more than an ounce. Matt says he has carried the watch a day or two, and it keeps as good time as any watch he ever carried.—*Knoxville Chronicle.*

A LITTLE GIANT.—A trial was recently made at the machine shop of Johnson, Hess & Co., Philadelphia, of a new application of power, with steam, to a five-wheeled engine, for propelling city railway cars. The application of power is so decided that, under a pressure of only 40 pounds of steam to a diminutive engine of only four-inch cylinder and four-inch stroke, a large truck, with several tons of iron on it and some 15 men, was pulled and backed for several hours, without apparent resistance. It is the opinion of those who witnessed the trial that this little giant will pull 50 tons with ease, with no smoke or noise from the exhaust of any account.

SCIENTIFIC PROGRESS.

Impure Water.

A simple test for organic matter in potable water consists in dissolving therein a small quantity of white sugar. In a few days, if sewage urine, albumen, or any other organic impurity be present, the water becomes white and milky from the development of certain fungoid growths. Prof. Frankland, F. R. S., presented a paper on this subject to the Chemical Society of London, as long ago as February 2d, 1871. In this paper he advanced the theory that these germs are everywhere present in the atmosphere, but that they cannot develop in the sugar solution without the presence of phosphoric acid or some compound of phosphorus. The following comparative tests were recently made in this city to determine the value of Prof. Frankland's suggestion in a practical way. Four eight ounce bottles were filled with water, and to each was added one gramme of powdered sugar. The first of these solutions, which contained boiling distilled water and no air, remained unchanged during the whole experiment, lasting 50 days. No. 2, which contained Croton water and a little air, began to exhibit a white sediment in nine days, which seemed to adhere to the bottom of the bottle. In two days the third solution, to which had been added five c. c. urine (or about two per cent), had a milky look; in three days a heavy froth on top, and in eleven days was perfectly opaque, and contained small white flakes; at the end of a month still heavier deposit and cloudy; in 50 days less opaque, heavy sediment. To the fourth solution was added six c. c. of a solution of phosphate of soda. The changes were more marked than in Croton alone, but far less than in that containing urine, showing that some other ingredient than phosphorus aids in producing the change. Neither two nor four are opaque at the end of 50 days unless shaken to diffuse the heavy sediments in them.

An English chemist suggests the employment of the neutral sulphate of peroxide of iron as an agent for

Restoring Impure Water.

The iron salt being added in a very delicate state to the water to be operated upon. The proportion in which this solution is to be added to the water is determined by the degree of impurity characterizing the water; and the proportions suitable must therefore be determined by careful experiment practiced from time to time, if the impurity of the water is found to vary. The water to be purified may be run into a tank or reservoir, and the solution of neutral sulphate added as it runs in, so that the solution may be well mixed with the water. A short time after the neutral sulphate is added to the water it becomes decomposed, and forms, with some of the impurities contained in the water, a basic salt, which is insoluble in water. The solid and insoluble particles of this new salt are precipitated, and, together with the impurities contained in the water, form a sedimentary deposit, from which the purified water may be allowed to run off, leaving the deposit in the tank or reservoir. A repetition of this precipitating process on other bodies of water which may be run into the same tank or reservoir will cause additional deposits, which, when allowed to accumulate to a sufficient depth, may be collected and removed from the reservoir from time to time.

Peculiar Growth of Wood.

At a recent meeting of the Academy of Natural Sciences of Philadelphia, Mr. Thomas Meehan called attention to the many varying hypotheses in regard to the eccentricity of the annual layers of wood in plants, which is sometimes so great that, as recently shown by a writer in the *American Naturalist*, the pith (in the common poison vine) is wholly on one side, and once in a while seems like a little ridge running along just beneath the bark. In the poison vine the greatest thickness of wood seems generally on the side between the pith and the object the vine clings to, and the writer referred to surmises that the rootlets coming out on that side may have something to do with this interior thickening. Another gentleman, Dr. Hickok, of Poughkeepsie, thought only those trees which sloped a little thickened chiefly on the under side. These hypotheses were inconsistent, and Mr. Meehan thought the true cause of the thickening of woody layers more on one side than the other had yet to be explained. The rooting on the under side could not cause the thickening of the wood, as *Wistaria* and many others which he mentioned, rooting on the ground as they ran, did not thicken in consequence; while *Ampelopsis* did, as well as the poison vine. The rootlets by which the poison vine attached itself to the trees had been referred to as being of some age; but this was a mistake, as in most cases, save some orchideæ and a few other plants aerial rootlets, like rootlets beneath the earth, were mostly annual. The whole root system of plants was, indeed, but the analogue of that system which existed in the atmosphere. Morphology had made a great stride when it pronounced all the parts of the inflorescence but modified leaves. Botanical science had yet to go further. The whole plant was but a modified leaf, roots as well as branches. The same general laws that we found in the aerial system, therefore, had their correspondence in

the terrestrial one. In the terrestrial system we generally saw a marked difference in the leaves and branches; but in some cases, as the arbor-vitæ and deciduous cypress, the two were so blended together that at the annual "fall" season branchlets and leaves all fell together. In these cases we saw that some of these compounds of leaves and branches—those the most favorably situated as regards nutrition—maintained a hold on life, and, once passing this critical time, had an indefinite lease of life thereafter. It was precisely the same with the rootlets of trees. They were the representatives of leaves, and myriads died every year. Only here and there one endowed with greater vital privileges escaped the annual "fall," and then it became a "root," with various terms of endurance. Aerial roots, used by some creeping vines, were under the same laws. Now and then one would find itself in a soft crevice of an old wall or in the decaying hollow of an old tree, and thus become a permanent feeder to the tree. In England the evergreen ivy had been cut down near the ground, after running for years over old ruins, and had continued to live on. But in these exceptional cases it was found that some of the rootlets, as the rule, annual, had found some soft place and taken on a permanent character—had become real feeding woody roots. He exhibited some old stems of *Ampelopsis Virginiana*, which for many years had been hanging unattached from the branches of a tree, and which had eccentric wood, as in the attached poison vines, and the surface was covered with aerial roots, which were produced and died annually.

Taking Down Speeches by Machinery.

When a flame is burning at the opening made in drum, at the head of which there is a very elastic membrane stretched, any noise or vibration, as by speaking or singing, will also set this flame in vibration, which vibration will differ in its nature according to the nature of the vibrations of the air communicated to the flame, and if now a rotating mirror is placed before the flame, revolved at a proper rate of speed, a series of images of the flame and of intricate figures will be seen in the mirror, and with lenses these figures may be thrown on a wall or a screen, and the figures thus thrown will appear in great variety, as various as the sounds which produced them, every sound having its own corresponding figure.

It is now suggested to employ a flame of high chemical intensity, so that it can make photographic impressions, and to replace the screen by a prepared strip, moving like a stock telegraph, at a proper rate of speed, so as to receive the successive impressions regularly in line; and if the various signs thus produced are properly interpreted as to the original sounds which have originated them, we will have a photographic record of speeches, etc.

Oil as Fuel.

At a recent meeting of the Scientific and Mechanical Society at Manchester, an interesting paper on the use of oils for fuel was read, from which we take the following:

In experiments as to the comparative value of coal and oil for the production of heat, a quantity of oil weighing less than five pounds was mixed with water, in the manner proposed for use, in a suitable apparatus, and without the aid of artificial draft burnt for 15 minutes with a flame 34 inches high and 2½ wide; a superiority over a similar weight of coal which is self-evident.

We have therefore, not only a cheap, but, including foreign sources, as great a supply of fuel in oil as in the stone coal; occupying in transportation less space and more easily handled.

A further, not sufficiently prized, advantage in the use of oil is, that a more constant heat can be maintained, as with addition of fresh coal to a fire there is a very considerable and rapid diminution in the heat. Secondly, being more easily controlled, a single man can mind quite a number of boilers, thereby lessening the present large force necessary. Thirdly, as a great advantage to steamships as preserving an equal calorific power, with much less weight.

LIGHT AND ANIMAL ORGANISM.—A favorite hypothesis is that the waking state is maintained in a great measure, if not wholly, by the constant summation of sensory stimuli; and that, by keeping the centrifugal nerves continually in a state of activity, the waking state reacts upon the processes of assimilation and decomposition throughout the body. This hypothesis rests upon a broad basis of circumstantial evidence derived both from physiological and pathological sources. Flatau has performed a series of experiments to ascertain directly whether stimulation of the retina by light really exerts any appreciable influence on the chemical change going on in the system (*Flatau's Archiv*, xl., 4 and 5). Rabbits were made to breathe pure oxygen instead of atmospheric air; the carbonic acid gas given off from their lungs was absorbed by a solution of potash, and quantitatively determined. Light was admitted to, and excluded from their eyes, during alternate periods of 30 minutes; the proportions of oxygen absorbed, and of carbonic acid given off during the intervals of illumination, being compared with those absorbed and given off during the intervals of darkness. The ratio as regards the oxygen proved to be 116:100; as regards the carbonic acid 114:100; thus confirming the results long ago obtained by Moleschott with frogs—results vitiated by the untrustworthy methods of investigation he employed.

Completed every Thursday from Advertisements in the Mining and Scientific Press and other S. F. Journals.

ASSESSMENTS. STOCKS ON THE LIST OF THE BOARDS.

Company.	Location.	No. Amt. Levied.	Delinq't.	July.	Secretary.	Place of Business.
Adams Hill Coal M Co	Enreka Nev	7 25	May 2	June 12	W V Traylor	309 Montgomery st
Belmont Coal M Co	Nye Co Nev	8 50	Mar 28	May 4	Frank Swift	418 California st
Caledonia S M Co	Washoe	17 108	Apr 18	May 22	R Wegerer	414 California st
Cosmothan M Co	Nev	3 35	May 18	June 10	C E Sanders	307 Montgomery st
Crown Point M Co	Washoe	25 100	Apr 11	May 10	C E Sanders	307 Montgomery st
Great Ear tern Com Q M Co	Washoe	3 10	Apr 15	May 10	J G Riley	331 Montgomery st
Gould & Curry S M Co	Nev	26 150	May 18	June 23	A K Durbow	309 Montgomery st
Harvey & Crocker S M Co	Washoe	15 50	May 18	June 23	E L Lister	401 California st
Hussey Con G & S M Co	Washoe	1 15	Apr 15	May 18	R H Brown	402 Montgomery st
Leviathan M Co	Nev	3 50	May 19	June 20	F E Linty	307 Montgomery st
Meadow Valley M Co	Ely District	11 200	Apr 16	June 3	T W Colburn	418 California st
Newark S M Co	Ely District	12 50	May 16	June 20	D A Judd	418 California st
Nicaragua G & S M Co	Washoe	12 50	May 16	June 20	Wm Willis	309 Montgomery st
Oil Sherdan S M Co	Washoe	4 75	May 1	June 1	Wm Willis	309 Montgomery st
Paragon G & S M Co	Idaho	1 100	Apr 14	May 19	R W Townsend	Neveda Block
Prospect G & S M Co	Washoe	1 100	Apr 24	May 29	R W Townsend	Neveda Block
Sage M Co	Washoe	23 200	Apr 4	May 6	J P Moore	320 Sanome st
Sucor M Co	Washoe	15	May 15	May 16	E B Holmes	309 California st
Sierra Nevada S M Co	Washoe	44 200	May 23	June 26	Gen D Edwards	414 California st
South Comstock G & S M Co	Washoe	4 10	May 3	June 6	H E Evans	309 Montgomery st
Starr King S M Co	Nev	13	May 4	June 1	J M Baffin	31 California st
Sucor M Co	Washoe	14 40	May 17	June 26	L K Pann	Merchante E
Trojan M Co	Nev	2 25	Apr 14	May 11	W H Watson	302 Montgomery st
Webfoot M Co	Elko Co Nev	3 25	Apr 14	May 11	D D Jennings	401 California st

OTHER COMPANIES—NOT ON THE LISTS OF THE BOARDS.									
Alameda Coal M Co	Cal	3 110	Mar 17	Apr 30	F Budke	409 Battery st			
Amador Coal M Co	Nev	8 10	Apr 21	May 27	J M Buhntman	311 California st			
Amador T M M Co	Cal	5 10	Apr 18	May 20	H A Paul	320 Montgomery st			
Beaver M Co	Nev	1 10	May 19	June 24	W G Hanges	314 Montgomery st			
Beckve G & S M Co	Nev	17 50	May 19	June 24	O A Sankey	331 Montgomery st			
Carlie Hale Hydraulic M Co	Cal	3	Apr 18	June 1	W Van Reynegon	54 California st			
Chico M Co	Washoe	15 25	Apr 13	May 16	Frank Swift	418 California st			
Coquille Black Sand G M Co	Oregon	2 40	Apr 13	May 15	F R Reynolds	1115 Leidesdorff st			
Danery G & S M Co	Nev	1 15	May 15	June 6	G R Snodden	320 California st			
Denver G M Co	Cal	75	Apr 8	May 16	A C Sweetner	Neveda Block			
Emerald T M M Co	Cal	4 25	May 2	June 25	H E Evans	309 Montgomery st			
Equitable Tunnel & M Co	Utah	12 20	May 13	June 5	C S Healy	Merchante E			
Gen Thomas M & M Co	Nev	11 5	May 1	June 5	W Willis	309 Montgomery st			
Globe Con M Co	Washoe	8 25	Apr 29	June 18	P M McLaeseen	Cor Cal & Montg'y st			
Hope Con M Co	Cal	5 10	Apr 19	June 17	Jacoby	405 California st			
Howard Hill G M Co	Cal	6 25	May 12	June 17	F J Hermann	415 Kearny st			
Iris M Co	Cal	2 25	May 2	June 27	F Madge	Merchante E			
Jefferson M Co	Cal	1 50	May 5	June 30	A Sankey	331 Montgomery st			
Larry Franklin G & S M Co	Nye Co Nev	1 50	Apr 3	May 5	Wm Willis	307 Montgomery st			
Manefield Land & M Co	Cal	5 25	May 19	June 12	J M Buhntman	311 California st			
Mariposa G M Co	Cal	5 10	May 2	June 30	L L Leavitt	309 Montgomery st			
Mariposa S M Co	Inyo Co Nev	10	May 3	June 3	P M Bawson	318 Montgomery st			
New Coso M Co	Cal	3 50	May 9	June 14	J D Verdinal	409 California st			
Nonpareil G M Co	Tuolumne Co Cal	5 100	May 9	June 12	A D Pratt	565 Jackson st			
North Carson S M Co	Nev	11 25	Apr 29	June 1	W A Van Bokkelen	310 Sanome st			
Onida M Co	Cal	10 5	Apr 19	June 24	David Wilder	328 Montgomery st			
Onida M Co	Cal	11 100	Apr 20	May 23	Louie Kaplan	Merchante E			
Reliance M Co	Washoe	3 10	Apr 13	May 15	David Wilder	328 Montgomery st			
Representative S M Co	Washoe	3 25	Mar 30	May 22	L T Cowie	Virginia, Nev			
Rose G M Co	Cal	10 5	Apr 19	June 27	W C Cowie	309 California st			
Roman Capital G & S M Co	Washoe	2 40	May 2	June 5	P J Zyza	Virginia, Nev			
Romish & Reedy M Co	Washoe	1 10	Apr 28	June 1	O H DeSance	418 California st			
Silver Sprout M Co	Nev	10	Mar 18	June 4	T B Wingard	225 Montgomery st			
Stokck Broker M Co	Nev	1	May 6	May 31	O H Bostert	325 Montgomery st			
Taylor M M Co	Garden Valley Dist	1 20	May 15	June 21	S S Murley	607 Montgomery st			

MEETINGS TO BE HELD.

Name of Co.	Location.	Secretary.	Office in S. F.	Meeting.	Date.
Alabama M Co	Cal	W H McCintock	419 California st	Annual	May 3
Almaden Con Quicksilver M Co	Cal	P Mathews	436 California st	Special	May 3
Alpha Con M Co		W Willie	309 Montgomery st	Annual	June 1
Arizona S M Co		W Willie	309 Montgomery st	Annual	June 1
Black Bear Quartz M Co	Cal	W Lette Oliver	216 California st	Annual	May 1
Con Ohio M Co		D H Everett	405 Front st	Annual	June 1
Crown Point G & S M Co	Washoe	C E Elliott	419 California st	Special	June 1
Flanagan S M Co	Washoe	W Willie	309 Montgomery st	Annual	June 1
Florida S M Co		Called by Trustees	320 Sanome st	Special	June 1
Hartford M Co		E F Sione	419 California st	Special	June 1
Lady Franklin G & S M Co	Nev	F E Linty	307 Montgomery st	Annual	June 1
Michigan M Co		G Hammond	401 California st	Special	June 1
Mineral Fork M Co		R B Neely	419 California st	Special	June 1
Quesada M Co	Cal	W H McCintock	419 California st	Annual	June 1
Silver Hill M Co	Nev	Called by Trustees	419 California st	Special	May 1

LATEST DIVIDENDS (within three months)—MINING INCORPORATIONS.

Name of Co.	Location.	Secretary.	Office in S. F.	Amount.	Payable.
Alps S M Co	Ely District	O D Spnrce	Stevenson's Bldg	50	Apr 1
Belcher M Co	Washoe	W L Kibbe	419 California st	100	Apr 1
Black Bear Quartz	Washoe	W L Oliver	316 California st	40	May 1
California N Co	Washoe	C P Gordon	309 Montgomery st	2 00	May 1
Con Gold Hill Quartz M Co	Washoe	R Wegerer	411 California st	2 25	Apr 1
Cos Virginia M Co	Washoe	Chas H Fish	411 California st	2 00	Apr 1
Empire M Co	Nevada Co Cal	D A Jennings	401 California st	50	Apr 1
Empire M Co	Sierra Co Cal	Chas Collienhorn		50	Mar 1
Empire M & M Co	Washoe	E F Dean	414 California st	50	Apr 1
Imperial S M Co	Washoe	W L Kibbe	419 California st	50	Apr 1
Leopard M Co	Nev	R H Brown	402 Montgomery st	75	Feb 1
Northern Belle M & M Co		W Willie	309 Montgomery st	1 00	Apr 1
St Patrick M Co	Cal	P F Verdinal	414 California st	50	Feb 1
West Comstock G & S M Co	Washoe	Oliver G Wood	514 California st	50	Mar 1

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General News Items.

The Pope is 84. He may live to celebrate his centennial.

At a meeting of Plymouth church on the 18th, Henry C. Bowen was expelled by a unanimous vote.

The infant son of Princess Christina, born on the 10th, died on the 20th, at Windsor castle. The Princess progresses favorably.

S. S. BURETT has been compelled by reason of bad health to resign his position as Commissioner of the General Land Office.

There are 1,436,210 bushels of wheat, 502,207 bushels of corn and 233,507 bushels of oats in the Chicago elevators.

SIMON MAYO, while exhibiting a fire-escape in Chicago recently, fell from a fifth-story window, and died soon afterward.

BORN Daniel Drew and Commodore Vanderbilt are still seriously ill. The condition of the latter is more serious than for several days.

The President has nominated General E. F. Beale, formerly of San Francisco, as Minister to Austria, to succeed Orth, resigned.

The mental condition of the Sultan causes grave apprehension. He is subject to delusions, fearing that he will be buried alive or poisoned.

The Senate bill granting a site for an observatory to the Trustees of the Lick observatory with an amendment providing that if the land granted be used for any other purpose than for said observatory, it shall revert to the United States, has been passed.

The committee appointed by the New York bar association in reference to the charges against Charles O'Connor, have agreed upon a report, which will be submitted at the next meeting of the association. The report is wholly favorable to O'Connor.

A DISPATCH from Panama states that peace has been proclaimed between Guatemala and Salvador. The army of Salvador has surrendered at discretion. Valle, late President of Salvador, has embarked for San Francisco. General Santiago Gonzales, Commander-in-Chief of the Salvador army, has left for Nicaragua. Dr. Rafael Zedivar has been proclaimed President of Salvador.

FRENCH WORKMEN FOR THE CENTENNIAL.—A special dispatch from Paris, May 24th, says: The most careful and elaborate preparations are being made for executing the intention of the Legislature in sending to the Centennial exhibition at Philadelphia practical representatives of all divisions of industry. Auguste Des Montins is chosen to investigate and prepare an exhaustive report on educational matters. The Government is taking measures to secure intelligent and honest delegates from the trades organizations.

FROM THE CENTENNIAL.—Our readers will find in the present number of the PRESS a continuation of editorial correspondence from the Centennial. From all quarters the latest reports are the most favorable. There has been a steady increase in the receipts, and the criticisms on the great exposition, regarding both the display and its management, are exceedingly favorable. The position taken by the committee on Sunday exhibitions seems to receive the popular support. A grand success for the great Centennial exposition is evidently assured.

AUREOLA.—This is a valuable location on the northern portion of the great Constock ore belt, only a few hundred feet south of the Florida mine, and on the same large gold and silver bearing ledge now being developed by the Florida and Rock Island companies. Assays from the croppings give a high average in both silver and gold, and there are indications of a huge ore chimney between 600 and 700 feet in width. The company do not expect to have sunk over 150 feet to strike plenty of good ore.

RAILROAD COMMISSIONERS.—The Governor has appointed as railroad commissioners General George Stoneman, formerly of the army, now a farmer in Los Angeles county; Isaac W. Smith, at present residing in this city, who is said to have graduated at the Military Academy of Virginia, to have been largely connected with railroad engineering in the East, and to have constructed the Willamette canal and locks in Oregon; and John T. Doyle, of San Mateo, a well known lawyer.

THE LANCASTER (PA.) NICKEL MINE.—This mine is yielding about 6,000 tons of nickel ore per year. The number of men employed is 100. Improvements have recently been added to the extensive works. A new shaft has been sunk about 200 yards to the westward of the main one, 110 feet deep, through a solid body of nickel ore, being opened upward from a tunnel below. Eleven shafts have now been sunk, ranging from 110 to 140 feet in depth, and are connected by tunnels underneath. Four engines are in constant use, two at the mines and two at the smelting works, ranging from 25 to over 100 horse power, and one pump throws over 200 barrels of water at each stroke. A number of small railroad tracks have been laid, which run in all directions to convey the metal from the shafts to other convenient points, and an superior macadamized road has been built from the mine to the smelting works, paved with slag from the furnaces to the depth of at

least three feet, and extending a distance of three-quarters of a mile. The owner, Joseph Wharton Jr., of Philadelphia, has recently purchased the adjoining farm, containing 87 acres, at \$160 per acre. This mine had been worked prior to the year 1744, being noticed by the commissioner who divided Sadsbury township in that year, which appears in Rupp's History of Lancaster County. The mines are situated along the Gap ridge, about three and one-half miles to the westward of Gap station, on the Pennsylvania railroad, and were designated as the "Gap mines" by Governor Morris and by Thomas Penn in the year 1755.

A PARTY of gentlemen of Sacramento have organized a company to operate a new discovery, in the form of a bill of fire clay, located in Placer county, about 70 miles from Sacramento.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

California.

ALPINE.

MINING ACCIDENT.—CLOSE CALL.—*Chronicle*, May 20: On last Monday an accident occurred at the Eschequer mine, near this town, which gave a couple of the employees a close call. The cage brought up a car load of ore, which was run out and dumped by the car man, Robert Lindsey. In the mean time a miner stepped on the cage and was sent down the shaft, but the cage was barely out of sight when Lindsey returned, pushing the empty car ahead of him toward the shaft, not noticing the absence of the cage until it was too late—the car went tearing down the shaft, Lindsey falling on top of it. About 20 feet down it struck the timbering and turned over, catching Lindsey by the knee and holding him tight, for a moment only, against the side of the shaft, but Lindsey had the presence of mind to utilize that precious moment by grasping the cage cable, and had just succeeded in getting a strong hold as the car again got free and went thundering down the shaft. Lindsey clung on to the cable to the top and was saved. The man that went down on the cage heard the noise above, and fearing an accident, jumped off at the 300-foot level just in time to save himself, as the falling car damaged the cage very much. It is a tremendous escape, as Lindsey who has had one or two other narrow escapes in this shaft.

ILLINOIS-CALIFORNIA.—We hear that a heavy feeder of fine looking quartz has been cut in this tunnel, and that water is beginning to come in at the face of the tunnel, an indication that a ledge may be close at hand.

BUTTE.

MINING.—*Mercury*, May 20: The Federal Point mining company, in Nimeshew township, are at work driving a tunnel of 600 feet, by which they expect to fully open up their claim. Already they have met with several good paying streaks of gravel, but do not intend to commence working there until they have fully opened up the mine now in 300 feet, and are pushing forward as fast as possible. The ground is among the richest in the county, and when once opened will prove a good investment. Mike Robinson has charge of the work. He showed us a lot of gold he had taken out while running the tunnel, that proves that it is there in paying quantities.

EL DORADO.

THE NEW DITCH.—*Republican*, May 18: A force of men are now engaged upon the unfinished section of the new ditch, and it will be pushed to completion as rapidly as possible. In the mean time there is already a heavy supply of water as the supply this side of the gap is believed to be more than ample to supply every demand up to the time of the completion of the entire work.

THE main shaft of the Young Hermon mine is now down 60 feet, and another on an incline, starting from the same point, is down 45 feet. At that point a drift has been run through connecting the two, the distance being about 100 feet, and is solid quartz all the way. If, as is represented, it will work from \$9 to \$12 per ton, there is fabulous wealth buried there.

INYO.

DEFIANCE MINE.—*Coso Mining News*, May 20: The timbering in the main incline, or hauling shaft, has been completed, and the machinery will be set in motion next week. On the 80-ft level, between the middle and south winzes, in cutting west a very large body of rich ore has been developed. From the south winze, on the lower level, a drift has been run north 40 feet through a solid body of hard galena ore. One hundred and twenty feet south from south winze, on the lower level, a shaft has been run, and a solid body of hard galena ore has been developed. On vein No. 2, 40 feet south from main tunnel, a large body of hard and soft galena ore has been developed, the hard ore being about 10 feet in width. North of the main tunnel they are still working in the extensive ore bodies heretofore described, with no signs of diminution.

FRONTIER.

DEFIANCE FURNACE.—During the past week, in consequence of a mistake made in the manufacture of the improved water-jacket (it being some three or more inches too small), it was found necessary to remove it and put in its place the old one, which has been thoroughly overhauled and repaired. Consequently much valuable time was lost, and the product of bullion is quite small as compared with the weekly runs made heretofore. The old jacket is working well and turning out its usual amount. There were shipped during the week 420 bars, 190 bars being now on hand. In consequence of improvements in the building not contemplated at first, furnace No. 2 is not yet ready to start, but will undoubtedly be running in a few days. The new jacket is the improved one of Shepard & Rawlings, being several inches larger than the first one ordered, and will undoubtedly give the most satisfactory results. As ore is arriving at the furnace in large quantities and the company have some 30,000 bushels of coal on hand, we may expect a long run and large shipments of bullion when the two furnaces are in successful operation.

WORK on the mines of the Minietta Belle mining company is being vigorously prosecuted, there being 30 men employed on the mines and in bringing the water from Snow's canon, which water right was purchased by the company last week for \$3,000 cash. There are about seven miners' inches of water in the canon, which is quite sufficient for all purposes of this company, and several others. The water will be brought through pipes a distance of about four miles, and the pressure will be over 1,000 feet, which will carry it on top of Lookout hill and then be capable of throwing a stream 100 feet high. On the Minietta a shaft has been started, is now down 80 feet and will be continued to a depth of 200 feet. It is being driven following the vein at an angle of about 42 deg., and for the total depth thus far reached is through splendid ore. At a depth of 80 feet in this incline, a cross-cut has been made, showing an ore body of 31 feet.

PANAMINT.—We regret to learn from parties arrived from Panamint that the S. V. M. & W. Co.'s splendid 20-

stamp mill has at last been compelled to shut down for want of ore. We cannot yet believe, however, that the bottom of the ore body of the immense veins shown on the surface of this company's mines has been reached, and feel sanguine that the deep shafts now contemplated will pass through what is termed the "barren zone" and then will be encountered large and permanent bodies of ore. We understand it is the determination of the company to sink on the Wyoming and Hemlock shafts to the depth of from 800 to 1,000 feet to ascertain beyond a doubt whether or not they have deep mines. This, we think, would have been the best course to pursue in the first place—but better late than never. This company is entitled to much credit for its pluck and indomitable perseverance in the Panamint district, and we sincerely hope its further labors will be rewarded by the strike of a solid silver bonanza.

NEVADA.

SILVER MINES.—*Foot-Hill Tidings*, May 20: To be a mine one of our silver-bearing veins must furnish ore which will pay a profit above extraction and reduction. This by any process of reduction heretofore used here has not been possible, but high hopes, based upon the Fryer process, are now entertained that the silver may be taken out with profit. All along the foothills, five or six miles below Grass Valley, lying between the copper belt ranging along by Spencerville and the regular gold belt of Grass Valley, is a belt of ledges or veins of quartz which contains silver in larger quantities than gold. These are sulphuretted ores, and by common mill process yield up very little of either, though by assay they show \$40 to \$50 in silver and \$5 to \$10 in gold to the ton. Many of these are strong ledges, and if some method could be brought to bear on the ores to tame them or break up in any way the combination of silver and gold with the base metals, so as to allow of the amalgamation of those of noble men with their mercurial affinity, much wealth would result therefrom. Here is an opportunity for Fryer, O'Hara or any other man to immortalize himself and at the same time to make an ample fortune.

PLACER.

DITCH FLAT NEWS.—*Forum*, May 18: The Central claim cleaned up on Friday and is being refitted, so as to wash on a lower level and pass the tailings through the little Pine Top claims, the right of way so to do having been obtained from the owners of that claim. The Dunning claim is still being worked. The Franklin is still plugged; the Superintendent has had a crew of men shoveling the debris away from below, but the loose material near the surface falls into the shaft in such quantities that he has put in a string of pipe leading up the tunnel to the shaft with the intention of washing it out from that point. He will no doubt have this claim washed again in a few days. The Ledger claim had the misfortune of having the mouth of the small tunnel leading into its shaft completely buried by a cave on Friday morning. The material and the situation being such that it took until yesterday to reopen it. The water at the time of the cave was immediately turned into the Yankee, so the delay would have caused but little loss, were it not that it compelled the driving ahead of the Polar Star is off pending the preparation of a powder blast. The Summerset claim has started in on their second run for the season, and are washing mostly at night.

AT GOLD RUN.—The Indiana Hill and Cedar claims are off cleaning up. It is expected that they will resume washing to-morrow. The Gold Run claim has at last got into position to continue washing and promising well this run. The foreman says that he is going to clean up at least \$200 for each 24 hours' washing. The Hoskins and Sachs claims continue washing to good advantage. The Cement mill at Indiana Hill continues to crush and disintegrate the rich blue gravel lying on the bedrock at that point. The gravel is quite rich and is paying at the rate of from \$10 to \$12 per cord. The Haggard, Haggard & S. S. Shaffer, the foreman, was delayed about a week on account of the distributor which connects with the derrick failing to work. It became necessary to send to Nevada City to have the change made. It works splendidly now. From the indications of the ground sluices the foreman is satisfied that the clean-up on the first run will prove beyond a doubt that this is the bonanza claim of the company.

RAYMOND TUNNEL.—The superintendent of the Raymond claim, W. H. Rogers, had a survey made in regard to their tunnel, which showed that it would require a length of 2,200 feet to tap the bottom of the channel—rather a heavy undertaking. They have ground enough where they are working now to run them through the present season; then by moving their giants and pipes a short distance to Chance Point ravine they have sufficient ground to last them two years longer. The running of the tunnel will probably be delayed for some time yet.

LITTLE YORK.—The second slide took place in the Empire mine last week, causing a little delay. The bank at this junction is about 50 feet deep. There is a strata of 80 feet of clay and large boulders passing through the center of the ground on an angle of 45 degrees caused the slide. This strata of clay does not contain any gold whatever, and coming in such large quantities was not appreciated at the time. It will interfere with their first clean-up, but will add greatly to the future prospects of the claim. Christensen Hill claim has completed an expensive tunnel 670 feet long, which will be brought into use in a few days. This tunnel will give sufficient grade to work through for several years. This claim has paid a large amount in dividends during the last few years, and judging from the way M. Enright, the foreman, is handling it now, still better results are expected.

PLUMAS.

DITCH HILL.—*Cor. National*, May 13: The Caribon hydraulic company have been repairing their flume and ditch and will have it in running order soon. They have had considerable trouble with their flume along the lava bluff near Butte valley, owing to the large rocks loosened by the melting snow falling down and tearing away in some instances three or four boxes at a time. The ditch was broken in several places by slides, and in one place the bank slid away to such an extent that they had to put a flume across which was 30 feet high. Mr. A. W. Keddie, the superintendent, is a man of energy and perseverance, and keeps hammering away at it, and will have the water through as soon as any one else could. This company have the finest water privilege in the county, and probably there is no better place in the county for a flume than Butte creek, just below Miller's house, and there is enough water now in the creek to run a score of "giants," and such will be the case until far into the summer. I am informed that the creek never gets so low but there is sufficient water to run any hydraulic claim in California or anywhere else. Two large "giants" will be used in the claim, with a pressure of from 350 to 380 feet. The main pipe from the bulkhead to the distributor is 22 inches in diameter. From the distributor to the giant, 16-inch pipe is used. When these tremendous engines commence to make war upon the rich gravel banks there will be lively times in that neighborhood. This company have their claim fitted up in good shape, and in consequence of the fact that the North Fork mining company have about 300 inches of water in their ditch below the pipe, and have commenced piping. They have opened their claim on Barker hill about a quarter of a mile below where they were piping last summer, which gives them a fall of from 350 to 400 feet. The water is not yet through the high bank, but a force of men are at work on the ditch above the pipe and are driving it along as fast as possible, but progress is necessarily slow owing to the vast quantities of snow in the vicinity of Leeson's hutte. The ditch from Ohio valley is now open and the water has been through for a day or two, but small in volume. In the course of a week, though, there will be

some 2-0 inches from this source. The big pumping engine which was formerly used to raise water from Ohio valley, has been removed to Cummings' hill, and will be used to force water up to the top of the hill, as soon as it can be put in running order. This water will be raised something like 300 feet, and it is estimated that about 76 inches of water can be brought to bear upon the hill by this means. Cummings' hill is known to be very rich, and there is no doubt that this will prove a paying investment.

HUNOARIAN HILL.—Superintendent Killey, of Hungarian, was in town on Sunday, and on being "inter-viewed" gave us the following report of good prospects. Two giants are steadily at work night and day, and with plenty of water they are making a big hole in the gravel. The flume is not yet in bedrock, but Mr. Killey thinks they will strike it before a great while. The gravel looks splendidly, and prospects first-rate. Twice, within the past week, it has been found necessary to clean up two boxes at the head of the flume, and the result was 45 ounces of the coveted metal. As they have only run a short time, on top dirt, and with a nice, this result is a splendid indication of big pay this year. It does us good to record flattering prospects for this company, for they have worked at a disadvantage for several years.

FAST BRANCH COMPANY.—Mr. Jos. Halsted, superintendent of this company, was in town on Wednesday, and gave us a call. He says that they have thoroughly renovated their ditch, and now have about 2,000 inches of water running through it. The claim lies below Shoo Fly, where the pipes will commence operating in a day or two. The ground prospects well, and with the advantage possessed by this company, in the never-failing water right, it will undoubtedly pay richly. We are glad that the company have at last got fairly to work. They have had a long struggle and an expensive one, and now will receive their reward.

THE BELL QUARTZ MINE.—The new company are progressing rapidly with their operations at Elizabethtown. The tunnel is being driven night and day, and the shaft now being sunk for the purpose of getting water for the engine is in a mass of decomposed quartz, which prospects well, and gives promise that a long lead is in close proximity. The mill and the machinery will be brought from Reno as soon as the road is in good condition. The chances of this being one of the best paying quartz operations in the county are the best, and it is fortunate that the property has fallen into the hands of men who have the means to open it in proper shape, and put up the expensive machinery necessary to work it.

SAN DIEGO.

A NEW MINING DISTRICT.—A correspondent of the Union writes from Julian, May 8th, as follows: "I have just received a letter from Joseph Voshay, who has kindly furnished me a few items from the Vernon mining district, in which he is now operating. Mr. Voshay states that they have several locations in the district; the principal leads being named the Washington, the Whitman, (an Indian name), and the Saratoga. The ledge of the latter crop very high, at about a mile and a half, and averages from two to six feet in width; the croppings assay from \$50 to \$1,000 per ton. The location of this district is about 90 miles south of east from San Bernardino, and 10 miles south of the boundary line between San Bernardino and San Diego counties. It is 25 miles from what is known as Indian Wells, the terminus of the railroad, a little north of east of that point, with a splendid wagon road to the mines. Doubtless Mr. Voshay would like to have the helping hand of capital. He says everything to indicate that they will meet with success. I notice, by the way, that an article in the Scientific Press speaks of this district and locates it about 20 miles from Palm station, near the terminus of the railroad. The assays in general of a diffused ledge is reported. Lucky Barney, Les of Lee district, is reported to have bought into the late discovery."

SAN FRANCISCO.

GOLD IN BERNAL HEIGHTS.—*Post*, May 24: Victor Bessaire, Secretary of the French mutual benevolent society, is so firmly convinced that he has discovered a gold-bearing quartz ledge on Bernal heights, that he has filed in the Recorder's office a notice of the location of 1,500 linear feet of the Enreka lode and Paris mill, and mining company. Monsieur Bessaire is not the first prospector who has discovered gold-bearing quartz on Bernal heights, but if he develops a mine there of sufficient richness to pay for working it, he will be more fortunate than the hundreds of other miners whom this section of the coast range has impoverished.

SISKIYOU.

SALMON ITEMS.—*Yreka Union*, May 20: Tonkins, Taylor & Rainey's mine, the Evening Star, still keeps up its "lick," and the "clean-ups" at the end of each month continue to attest that the owners have a good thing. The Morning Star mill is crushing some very good rock, and it is expected that the next clean-up will pay handsomely. Quite a number of claims have been taken up and are being worked. The Evening Star, what is called the second bench of the river, and the prospects bid fair for good pay to be taken out. At the forks of Salmon, with the aid of the water brought in by Bennett & Miller's ditch, a number of claims have been opened and are paying well. The indications are that there will be a large number of people visit the Salmon section this summer.

GIVE IT UP.—Owing to the water coming in so fast, the parties who took the contract to sink 50 feet of shaft on the Empire ledge have thrown up their contract after sinking 13 feet. The company are now undecided whether to put in a pump and go ahead with the shaft, or to run a tunnel and drain the ledge in that way. They are now testing their quartz with an assaet, and if the result is such as to warrant the company may erect a mill, as the mine is so that they can already extract considerable quartz. The ledge is of good width, the rock of excellent quality, and increasing in richness as they go down.

VENTURA.

THE OIL WELLS.—The Signal of May 20th announces that arrangements have been made for the thorough working of the oil wells and the establishment of an oil refinery at San Buenaventura. On Tuesday a contract was entered into between Adams and Thayer of this county, and Robert O. Page and Reuben Denton, of San Francisco, experienced oil men, who have secured the services of the very best refiners, wherein Adams & Thayer will furnish 6,000 barrels of crude petroleum per month, and to deliver it at a price to be named by what is at San Buenaventura. The refinery is to be erected immediately and the delivery of oil will also commence at once. Thus another, the most important of all industries, has been added to our list, and San Buenaventura is taking the start as the leading manufacturing town in Southern California.

Nevada.

WASHOE DISTRICT.

CORN VENTURA.—Gold Hill News, May 13: Daily yield, 600 tons of ore, keeping the mills all steadily running up to their full crushing capacity. The Brunswick mill will be repaired and ready to run again in a very few days. The ore slopes show little or no change in any part of the mine. The east drift on the 1500-ft level to connect with the C. & C. shaft is well advanced, and is being pushed ahead with all possible energy. The erection of the new 80-stamp mill, east of the C. & C. shaft, is getting well under way; the most of the foundation timbers are already framed, the stone foundations are being laid, and much of the machinery is already on the ground. The erection of the amalgamating mill, on the site of the old Consolidated Virginia mill, is also being pressed forward at a very rapid rate.

of speed. The completion of these mills will add a crushing capacity of nearly 400 tons of ore per day to that now employed by the mine, and a like increase in the ratio of the hullion production.

CALIFORNIA.—Daily yield, 350 to 400 tons of ore. The ore-breasts on the 1500 ft level are opening up splendidly and promise a richer yield than any mine has ever yet made on the Ophir rock ledge. The California and Sacramento mills are kept steadily running on ore from the mine. On the 1600 ft level the north drift now being run to connect with the Ophir from the bottom of the winze tank below cross-cut No. 6 is in rich ore. The north drift on the 1400 ft level intended to connect with the Ophir at that point is making steady progress. The C & C shaft has reached the proper depth for connecting with the 1500 ft level of the Consolidated Virginia and California mines, and a station is now being opened at that point. The opening prospects are that the California will in a very short time be the leading mine in the world.

OPHIR.—Daily yield, 180 to 190 tons of ore. This amount of ore is more than the mill can crush, so that a large reserve of ore is being made. The mill is at all times running on the Ophir rock ledge. The ore-breasts are looking finely, and yielding ore of a good quality at every point. On the 1100 ft level a cross-cut east has been started from the main drift to connect with the upraise now being made from the 1300 ft level. The north drift on the 1600 ft level has a distance of about 112 feet yet to run to reach the point at which it is expected the ledge will be struck. On the 1700 ft level the drift and cross-cut have been cleaned out and repaired preparatory to starting the north drift toward the Mexican line. The mine is in better shape for the advancement of the prospecting on the lower levels, the extracting of ore, and the pressing forward of all kinds of work than it has ever been before.

BULLION.—The face of the combination drift, on the 2000 ft level now running in Alpha ground, has cut into the west clay wall of the ledge and may strike the ledge at any moment. There seems hardly a doubt but that this drift will strike ore, as the ore development in the Imperial mine has been extended so far to the northward as to almost insure such a result.

BELOHER.—The foundations for the new pumping engine and other machinery are well under way. Considerable quantities of the pumping and other machinery is now on the ground, and more arriving daily. Daily yield of ore, 450 tons. This yield of this ore is greatly increased over that of last month, the percentage of gold being nearly as great as at any time in the past. The air and drain shaft is completed down to the 1600 ft level.

JUNIA.—The southwest drift on the 1600 ft level is steadily advancing, with the face in very favorable quartz and ledge matter. On the 1800 ft level the southwest drift has tapped a strong flow of extremely hot water, which is considered a highly favorable indication of a strong mineral ledge.

LANY WASHINGTON.—Sinking the shaft has gone forward without interruption during the week, between three and four feet per day being added to its depth. The vein material at the bottom shows improvement.

ORIGINAL GOLD HILL.—The retimbering of the shaft requires more time and work than was at first anticipated. As soon as completed, sinking deeper will be resumed.

CROWN POINT.—On the 1700 ft level the main south drift is steadily advancing, the face still in quartz and low grade ore. The south winze from the 1600 ft level is down to the 1700 ft level, and is connected with the main south drift on that level, affording a much better ventilation in that portion of the mine.

CHOLLAR POINT.—Daily yield, 90 to 110 tons of ore, the assay value of which is \$33 per ton. This ore is taken from the old upper workings and is of a character of which the management has no reason to be suspicious. The erection of the machinery for the new shaft is making good progress.

ROSEBURY.—The water is drained to the 500 ft level, and this morning the station was cleaned out and everything found in good condition. The pumps have nothing whatever the matter with them, their stoppage being caused solely by a cave of mud and debris in the water tank.

IMPERIAL.—The extension of the north drift toward the Alpha ground was suspended a greater part of the week for the purpose of giving a better opportunity to start the north winze downward below the 2000 ft level. This winze is now down 15 feet, the bottom in ore assaying from \$150 to \$200 per ton.

AMAZON.—The south drift on the 300 ft level has been advanced 405 feet during the week. The drift is still following the wall of the ore vein, which is looking well. No cross-cuts have yet been run. The pumps are being put in position for resuming the sinking of the shaft.

BALTIMORE AND AMERICAN PLAT.—The ledge on the 1050 ft level still continues to show an improvement in both the north and south drifts on that level.

YELLOW JACK.—The cross-cut No. 1 on the 1400 ft level, is steadily advancing. So also is cross-cut No. 2 on the same level. The face of the last named drift is in fair ore. A cross-cut No. 3 is steadily advancing southward, the face in porphyry.

VIVIAN.—The mine is looking well throughout. The ore on the main track floor to the north is improving, also the south winze from the incline. The slope are yielding the best quality of gold-bearing ore. A quantity of ore is being shipped to the mill daily.

ORIGINAL COMBROCK.—It will not be long before the drift must intersect the ledge, as it is approaching in an oblique direction from the south end.

NORTH CONSOLIDATED VIRGINIA.—The station is completed and a large water tank is nearly finished at the 500 ft level. Sinking the shaft will be resumed by Saturday or Sunday next. The new pumping machinery has been contracted for in San Francisco, and will be forwarded at the very earliest opportunity.

OVERMAN.—Daily yield, 30 tons of ore. This ore is being extracted from the 800 ft level, and so far affords no new features in that portion of the mine.

UNION CONSOLIDATED.—The north drift on the 1300 ft level is still pushed ahead, the face in quartz and ledge matter of a very good quality. The cross-cut being run from the bottom of the south winze on the 1450 ft level, is also in ledge material, but has not reached the point at which it is expected to encounter the Mexican ore body.

GLASGOW.—A chamber has been cut out preparatory to sinking on the ore vein recently developed by the north drift on the 800 ft level. The winze has been sunk to a depth of eight feet, the bottom still in good ore.

MEXICAN.—The north drift on the 1450 ft level is steadily advanced, following the east wall of a ledge. Preparations for cross-cutting the ore vein at several different points on this level are going steadily forward. The north drift on the 1600 ft level of the Ophir is rapidly approaching the south line of the mine.

TRUMAN.—The new hoisting works and machinery are completed. It is the intention to sink the shaft, which is now down 187 feet, to a total depth of 300 feet, and then commence the extraction and milling of the ore now known to exist at that point.

JUSTICE.—The prospecting of the drifts both north and south, on the 800 ft level, are steadily advancing, with every prospect of opening up some fine ore developments in that portion of the mine in a very short time.

EAST OVERMAN.—Sinking goes ahead lively, and the most favorable prospects. The vein ore assure now proves itself to be fully 60 feet in width, showing plenty of both sulphur and chloride quartz.

SAVOIR.—The foundations for the new pumping engine are well advanced. Also the foundations for the hoisting and lowering the pumps into their places.

WEST BELOHER.—Retimbering the 400 ft station in the shaft has been completed. The west drift, on the

400-ft level, is in a distance of 285 feet, the face in low grade ore.

HALE & NORCROSS.—The immense stone foundations for the new machinery is being constructed at a very rapid rate, and the machinery is being placed in position ready for use at the earliest day possible.

ROCK ISLAND.—The north drift on the 850 ft level is steadily advancing, the face showing spots of fine quartz and occasional bunches of good ore.

MONUMENTAL.—Steam hoisting machinery has been ordered from San Francisco, and will arrive in a very short time. Preparations for the erection of new hoisting works are also being made.

SUPERIOR.—The quantity of quartz in the bottom of the shaft is showing a steady increase, and it cannot be long now before the main ore vein will be reached.

BROOKS.—The main shaft bottom is in ledge material intermixed with quartz of an excellent quality.

WARD.—The erection of the new hoisting machinery is fast approaching completion.

GOULD & CURRY.—The erection of the new pumping machinery is going steadily forward, as rapid a rate as is consistent with the permanency and durability of the work.

BEST & BELOHER.—This mine cannot do but little toward the development of the 1700-ft level until the new pumping machinery of the Gould & Curry is finished, ready to drain the water should any be found.

SILVER HILL.—The new station at the 550 ft level of the main incline is fast approaching completion. The flow of water remains unchanged.

SUPCOR.—Sinking the main shaft is going steadily ahead, the bottom still in fair anking ground, and the flow of water is still quite strong.

GLOBE CONSOLIDATED.—It is the expectation to soon commence cross cutting the ledge from the north drift.

DANBY.—Putting in the pump-hoist at the 400 ft station is making good progress. As soon as that is finished, the water will be extracted, and sinking resumed.

MINT.—Sinking the main shaft is still making rapid progress, the bottom in quartz and low grade ore.

LANY BRYAN.—Laying the foundation for the new and powerful pumping machinery is going ahead at a rapid rate of speed.

TRAM.—Sinking the main shaft is going briskly ahead, notwithstanding a strong flow of water.

ALTA.—The foundations for the new machinery are nearing completion. The pumping machinery will be first-class in every respect.

NORTH CARSON.—Arrangements have been made with the Virginia and Gold Hill water company for a full supply of water, for running the new hoisting works.

FLORIDA.—Cleaning out the main drift at the 400 ft level progresses rather slowly by reason of the large amount of water met with.

PHIL. SEHRIDAN.—The machinery is all working with the utmost perfection. The main shaft has been drained of water and put in first-class condition, and sinking resumed.

COSMOPOLITAN.—The raise above the main adit tunnel, near the north end, is still progressing upward, toward the surface, following the vein, and continuing in good ore.

PROSPECT.—Total depth of shaft 257 feet, 19 feet having been added to its depth during the week. Rock at bottom continues hard, but the Ingersoll drills are doing very effective work.

NAGARA.—Sinking the main incline is going ahead at an excellent rate of speed, the bottom still in soft ledge material.

SEVADA.—The face of drift continues in porphyry, quartz and streaks of low grade ore.

(Continued on Page 348.)

San Juan Mines.

Col. T. J. Anderson, the general passenger agent of the Atchison, Topeka and Santa Fe railroad, Topeka, Kansas, has just issued a pamphlet with maps and matter about the San Juan mines. From it we clip the following:

Perhaps no event could be more opportune, considering the deranged condition of labor and the depression of business throughout the country, than the discovery of the San Juan mines, in southwestern Colorado. Their extent, embracing as they do about 15,000 square miles, and their wonderful richness, exceeding in that particular the famous silver mines of South America, and far beyond any known in the United States, would seem a providential bounty, from which all classes and conditions may, for generations to come, draw support. West of Georgetown and Black Hawk, a little from Denver, runs in a southwesterly course the main divide of the Rocky mountains. Upon the extension of this almost unbroken chain, and in the southwest portion of Colorado, lie the San Juan mines. They are embraced within the counties of La Plata, San Juan, Conejos, Rio Grande, Hinsdale, Saguache and a portion of Lake. Upon the western slope of the main range, and upon the short, bold spur that shoot out westward from the main range, are found those rich silver deposits which have attracted thither thousands of stalwart men from all quarters of the world. Here are mines that it will take centuries to exhaust, and so numerous that it will take years of persistent prospecting to locate them judiciously. The principal silver mining districts are the Animas, Adams, Eureka, Uncompahgre and Lake, and with the exception, perhaps, of Lake, they are all within the limits of the new county of San Juan, while the discoveries next season will be made upon the mountains that lie along the Gunnison, the Uncompahgre, the lower Animas rivers, and along Cement and Mineral creeks, that empty into the Animas river at Silverton, and in the mountains southwest of Del Norte. The field for the prospector is rich and extensive.

THE NEW CALIFORNIA MILL.—A strong force is at work at the site of the new 80-stamp mill of the California mining company. It will stand a short distance east of the C. & C. shaft. The huge pits which are to receive the stone foundations of the batteries and engines are fast being excavated. The boilers are on the ground, also the battery blocks and other heavy timbers. When this mill is completed the pulp from it will be run to the present California pan mill and the pulp from the present stamp mill will be run to and worked at the new Consolidated Virginia mill, the former working California and the latter Consolidated Virginia ore.

The *Sunshine Courier* reports that the Caribou mine has been shut down, has been seized by workmen for wages due and will be sold for debt. Some bad management somewhere,

THE ENGINEER.

A New Coffier Dam.

The *Iron Age* says: On Saturday last there was launched on the Harlem river a coffer dam of novel construction, which will be used in connection with the work of the Dock Commission. The new coffer dam is formed by solidly framed wooden box walls, rectangular in section, and built with a flat bottom and disk, vertical sides, and of any length from 50 to 200 feet. A keel like that of a ship is attached to the bottom of each box wall, which steadies it in the water when afloat, renders it easy of movement by towing from point to point, and fixes it firmly on the bottom when it is sunk in position. The box wall is 15 feet wide from out to out, and its vertical sides are 35 feet high. Two of these wall boxes or caissons, placed parallel to each other, and from 30 to 40 feet apart, form the sides of the coffer dam, the ends being closed by A gates, as in a canal lock, the sills pointing toward the direction of the water pressure. These gates are hinged on the outer sides of the ends of the walls, and make a water-tight joint at the meeting of their leaves and at their abutment against the ends of the walls, by means of thick straps of vulcanized India-rubber attached vertically the full depth of the walls and gates. When needed for service, the floating coffer dam is towed to its place and carefully moored in position over the site of the work, care being taken that it embraces by its inclosing walls the entire area of operations. The hollow box side walls being divided into water-tight compartments, these are gradually filled with water by means of sluices arranged for that purpose, and under the weight of the water so admitted, the whole coffer dam slowly but evenly settles down on the bottom, the keels of the walls and gates biting into the soft mud and steadying the whole. The water-tight compartments are then filled to the top by pumping, and this additional weight forces the whole coffer dam downward in the soft stratum of mud that usually forms the bottom of deep rivers, estuaries and bays. In order to prevent under-leakage and to facilitate deep excavation within the enclosure, there are fitted to the insides of the perpendicular walls and ends a series of guides for heavy square piles, which hold the pile perpendicularly and close up against the walls, and so guide its downward motion into the deep mud in the same vertical plane as the wall face. To these piles are fitted broad wooden shutters, which fill the space between the piles, and when driven downward into the mud form a continuation of the wall to a depth sufficient to prevent leakage or disturbance of the sub-stratum when the inclosed space is pumped dry and excavated. These operations being completed, steam pumps, capable of exhausting the interior water at the rate of 20,000 gallons per minute, are set in motion, and the enclosure is quickly pumped dry and made ready for the excavators, pile drivers and masons, who work in the air, secure from danger, being protected by the inclosing wooden walls. When the masonry or other work reaches the level of high water, or even of half tide, the enclosure is again flooded, the piles with the shutter attachments withdrawn, and the hollow walls pumped clear of water. Then the coffer dam is again afloat, but it surrounds the work that was constructed within the enclosure. It is removed by withdrawing the bolts that secure the joints of the A gate, which is then opened, and the coffer dam is floated away, leaving the masonry surrounded by water.

Water Route from the Ohio River to the Seaboard.

The latest issue of the *American Manufacturer* notes an engineering project of considerable interest: In order to complete the connection of the Chesapeake and Ohio canal with navigation on the Ohio, through the Yonghiogheny, it is proposed to urge upon Congress an appropriation for the survey of the summit watershed and reservoirs of the proposed route, and also a relocation of the line in the upper part of Will's Creek valley. The former, it is stated, could be left until the work on the canal is actually commenced, and as there is no question as to the practicability of supplying the canal with water, the reservoir could be surveyed and built before the completion of the summit tunnel. The relocation of the line in the upper part of Will's Creek valley is not absolutely essential, as the present surveys have given a practicable line of canal. It is thought, however, desirable to make the lifts of the inclined planes more regular, which, in consequence of the complicated character of this portion of the route, has not been done in the existing surveys. Another proposition is a survey for an extension across the state of Maryland to the Chesapeake bay. This, it is claimed, will greatly enhance the value of the canal as a water outlet to the trade of Pittsburgh and of the Ohio river. The cost of this survey is estimated at \$15,000. It will be more expensive than the usual survey of such a length of canal line, because the great question will be that of water supply by reservoir and feeders, and this branch of the examination will require a thorough survey of the watersheds lying above the line of the canal, as past investigations show that an extension to the Chesapeake is impracticable without reservoirs.

Eads and the Mississippi.

Mr. James B. Eads, who has acquired a national notability through his undertaking to deepen the channel of the Mississippi by the jetty system, has written a pamphlet in defence of the theories on which his enterprise is based. He handles the report of the U. S. Commission of Engineers against the system without gloves, attacking vigorously the assumed facts and theories on which it is predicated. Mr. Eads' eminent success thus far toward the accomplishment of his great work peculiarly entitles his views on the subject of which he treats to marked consideration. The summary of his argument he gives as follows:

That increased volume will not permanently raise the flood line.

That outlets will not permanently lower the flood line.

That cut-offs will not permanently raise the flood line below them.

That the river water is not always under-charged with sediment.

That a relation exists between current velocity and quantity of sediment suspended.

That overpasses may cause deposits below them.

That the bed of the river is not too hard to yield.

That the statement that the river bed is a clay which resists the action of the current almost like marble, is an error.

It is upon negative assumptions to the above that the report of this commission against the system is founded. In most of his positions, if not all, we think Mr. Eads supports his theories by good and conclusive arguments. The limits of this article do not permit us to go into any discussion of the merits of the question or of the arguments used by Mr. Eads. It must suffice us here to remark that the practical results accomplished by the gentlemen afforded, even if we should admit that his arguments do not, some very stubborn proofs against the U. S. Commission.—*Vallejo Chronicle*.

MARRYING THE SEAS.—An American engineer, Mr. Spalding, has a project before the Russian government for turning the Black sea into the Caspian, which, if carried out, would make Mr. De Lesseps look to his laurels. The idea is to fill that great inland basin to the depth which it had many centuries or ages ago. A vast region about the Caspian sea is becoming a desert, and, according to Mr. Spalding, this deterioration was probably a primary cause of the great migrations from the East to Europe. He proposes to restore the sea to its ancient depth and area by making a great cutting, about 170 miles in length, beginning in the basin of the Caspian sea about 50 feet below the level of the Black sea, and cutting a channel 500 feet wide westward to such a point that at its western extremity it shall be about 35 feet deep. Thence to the Black sea he proposes a smaller and shallower cutting only 18 feet below the sea level at one end, and 10 at the other, and about 165 feet wide. With such a channel, widened and deepened by the action of the water, Mr. Spalding thinks that within 40 years the Caspian could be brought up so nearly to the level of the Black sea that navigation of the new channel could begin. This time could be shortened to about 25 years by the cutting of another channel connecting the Don and the Volga. The author promises magnificent results from the enterprise, political, military and commercial, to the empire to which he presents his scheme, and his memorial on the subject is now being translated into the Russian language by Russian military engineers.

PREPARING FOR THE FINAL BLAST AT HELL GATE.—The work of excavation at Hell Gate, preparatory to the final blast, has been finished several weeks, and the only work going on there at present is the pumping out of the water which filters into the mine from above, and the building of a piece of sea wall to protect the shore from the action of the current which will sweep against it as soon as the reef is removed. This wall, which will be 150 feet long, eight feet thick, and 12 feet high, is flanked at each end by a heap of debris, making an efficient protection to the soft earth of the shore. The testing of the various explosives used in submarine blasting has been going on for some time, and a dozen different preparations of nitro-glycerine were exploded on Friday last with a view of testing their efficiency for this work. The gun cotton prepared at Stonemarket, near London, has thus far given the most satisfactory results, and will probably be the explosive adopted. This material has not been much used in our government work, and no manufactory of it exists in this country. It will be placed in holes drilled in the pier and in the roof, those in the latter being pated five feet apart and extending half way through its thickness. About 30 tons of gun cotton will be required, which will be placed in position at the last moment, that it may be exposed as little as possible to the action of the water. The present appropriation will cover the expense of the final blast, and before that takes place it is hoped that a sufficient appropriation will be made to secure the removal of the debris.

The Diamond tunnel, Colorado, has intersected a new ledge at the distance of about 1,050 feet in the tunnel. This new discovery shows ore of a very good quality, and it is thought will prove valuable.

Mines and Mining in Montana.

The *Holena Independent* says: It is hardly necessary to tell our miners that it behooves them this year to put their best foot foremost. Self-interest would lead them to this if there were no other consideration of more than ordinary interest. We are running a race, as it were, with the other Territories. Before the close of the year we ought to be able to show that we have a better mining country, more gold and silver, and better facilities for making these metals reward our industry than any other community. It is pretty certain that we shall reap a great measure of the benefit of the crowded immigration which has flowed into the Black hills, and which, as the stupendous fraud which has lured them here becomes every day more transparent, will naturally seek an outlet into Montana. If our mines afford to these adventurers a reasonable hope of the riches which they were disappointed in obtaining in Costar's fairy land, they will stop among us and make good, industrious citizens. There can be no question among ourselves of the richness and variety of our mineral industries. Any one who has lived a year in Montana is satisfied of this; but the difficulty is in producing the same impression on the mind of others. It can be done if we only go about it in the right way. Strangers judge of others by what they seem. If our country pleases us it will please strangers as well. It is not surprising that in the first flush of the Black hills excitement a great many miners went away. It was natural that they should be attracted to a country where report said gold was to be found about the roots of the grass and was in nuggets along the beds of the streams. This was all very well for a stampede, but it will not do now. Something more solid and substantial is requisite to attract population. The public, which has been deceived once, will not be easily imposed on again. When it sees our mines at work, our miners earning a competence, if not riches, and an undeveloped area of still greater extent inviting energy and industry, it will be satisfied that we have the gold that the Black hills has not; but scarcely anything less than this actual experience will produce that conviction. As the Big Horn country fills up the tide of adventure will spread out and drift over the Territory. No single locality can hope to catch or retain the influx of people which will seek homes and employment in Montana.

A Cheap Window Ventilator.

Professor Kedzie writes us follows to the *London Sanitary Record*:

I propose a cheap window ventilator by which the air will enter in two thin layers, with an upward movement by which it will mingle with the warm air of the room so as to prevent sensible currents of cold air. Take two pieces of board a quarter of an inch thick, one inch wide, and as long as the lower bar of the window; three narrow pieces half an inch thick and one and a half inches long, one end being cut with the bevel of the window stool. Nail these pieces across one of the long slats, one at each end and one in the middle, placing the short side of each piece even with the lower edge of the slat. Nail the other slat on the opposite side of these short pieces, bringing the upper edge of the slat even with the square end of the short pieces. This will make a compound bar with half an inch between the slats, and one slat half an inch higher than the other when the whole is turned upon its edge.

Place the whole under the lower window sash, with the higher slat on the outside. The air can then pass under the outer slat, between the two slats, and enter the room over the top of the inside slat, having an upward motion which will cause it to mingle rapidly with the warm air of the room, and thus prevent any sensible draft. By thus raising the lower sash, a space will be left between the top of the lower sash and the bottom of the upper sash, through which another thin layer of air may enter the room at some distance from the layer at the bottom of the window. The air must also enter with an upward current, causing it to speedily mix with the hot air in the upper portion of the room.

This arrangement is especially adapted to secure safe window ventilation in bedrooms. If properly constructed and inserted, it will never cause sensible currents in the body of a room except when strong winds prevail, when we usually secure enough ventilation by the imperfect construction of our window casings.

OPERATIONS AT WHITE PINE.—We see by a recent issue of the *White Pine News*, that after being laid up four months on account of not being able to have work during the winter months, the Eberhardt and Anrora company mill started up on the 1st inst. During the vacation, the mill has been thoroughly overhauled from stem to stern, and is now in all respects as good as new. New shoes and dies have been placed in the pans, and much heavier stamps will be used in the batteries; as a consequence, considerable more ore will be crushed than formerly. Fifty tons will now be the daily average of ore put through the batteries. Various changes and improvements have been made throughout the mill, and it is thought she will now stand the racket throughout the summer, needing only ordinary repairs. There is not less than 1,000 tons of ore on the mill dump at the present time; all the mill teams are busily engaged in hauling ore from the mine, and no doubt is entertained but that the mill will be kept constantly running for the next six months at least.

USEFUL INFORMATION.

The Art of Skeletonizing Leaves.

A writer in *Land and Water* says: The subject having excited a little interest among some horticulturists lately, owing to the exhibition of some beautifully executed samples at some of the large provincial exhibitions held in the northern and midland counties of England, I took the liberty of appealing to a lady friend, who has been very successful as a skeletonizer of foliage, requesting her to favor me with the *modus operandi* by which she produces her specimens with such perfect completeness.

My informant states at the onset that this art of skeletonizing leaves and flowers would be found much less difficult of accomplishment were the nature and character of the various plants thoroughly studied at first. This is no doubt a very important matter. For instance, it would be but a poor direction to this learner to say, "Gather the leaves on a certain day," unless proper attention be also paid to the leaves chosen. They must have reached a certain degree of maturity, neither too old nor too young; and as all leaves do not reach this maturity at the same time it is obvious that care must be taken that each kind must be gathered when fit for use. The leaves of the magnolia, for instance, may be gathered when the plant is in bloom, varying in time from June till August. They will require from a month to six weeks' time to be well immersed, and so be easy to dissect, as the fiber is so strong. The leaves of the ivy rank among the most difficult, and, because of this peculiar heanty of the fiber, will amply repay the trouble involved in the preparation. These may be immersed from the beginning of May to October, but should be leaves of the previous year's growth. All leaves will not answer for dissecting, but those that have been most successfully operated on are from the magnolia, ivy, pear, rose, holly, orange, poplar, willow, elm, lime, service tree, Spanish and horse chestnuts and the oak. The leaves of the last named should not, however, be put into the same vessel with the others, as it affects them in an undesirable manner. Seed vessels may also be dissected in an admirable manner; such are those of the stramonium, winter cherry, poppy, etc.

To procure good specimens, put the leaves into a deep jar and cover them with soft water, which must not be changed; the jar is then to be put in a cool place. When, upon examination, the leaves are found to be soft, they must be carefully brushed in a weak solution of chloride of lime for a short time, to whiten the fiber, and afterward washed well in two or three waters and dried carefully between sheets of blotting paper or linen, after which they are ready for mounting. To make stems for this purpose, thread stiffened with gum is the most useful, and it has a natural appearance. The leaves may be formed into bouquets or wreaths, according to the taste of the operator, and should be placed under glass shades to preserve them from harm.

I have seen groups of leaves so prepared that formed acceptable table ornaments in sitting and drawing rooms; and it suggests a pleasant employment for the fair sex with which to fill up moments of leisure. It is evident that much discrimination in the selection of the right leaves is required, and a light and careful manipulation is also essential; and in the case of failure from the first attempt, no small amount of patience is needed to carry the operation through to ultimate success.

Light Weight Tin Plates.

A writer in the *Grocer* says that the canning trade has lately suffered great inconvenience from the fact that much of the tin plates suitable for the manufacture of cans are very light weight, ranging as low in some instances as 95 to 98 lbs. per box, when the net weight should be 112 lbs. There is no doubt that this complaint is well founded. As it is very difficult always to draw the tin sheets to the exact weight, a variation of three or four pounds is allowed. Anything from 108 to 112 lbs. is accepted as standard weight. For years such a thing as debasing the standard weight was unheard of, and a box of tin plates was considered as good as gold. Without arguing the question of the relative merits of the two systems of collecting duties on imported goods, it seems to be a fact that the standard weights of tin boxes under the ad valorem system remained unimpaired. As soon, however, as there was a change made from the ad valorem duty of 15 per cent. to the specific duty of 1.1-10c. per pound on tin, the idea occurred to some importers that the lighter tin the less the duty and the greater the profit, and the better the opportunity for competition. It is probable that the majority of the short weight tin sold to the packers has weighed in the neighborhood of 100 lbs. to the box, and that a comparatively small amount weighing as low as 90 lbs. has been imported. We do not say that tin plate of the weight of 90 lbs. to the box may not be useful for many purposes, not that the importers that have ordered this short weight tin have in all cases designed to impose it upon their customers for full weight, but we do say that it is not safe for packers of vegetables and fruits in hermetically sealed cans, especially of the

larger sizes, to use tin lighter than the standard weight, unless the quality of the thinner iron used more than makes up the deficiency in strength, which may possibly be the case, and now having their attention called to it they had better examine the weights of their tin.

Galvanized Iron Waste.

A Wolverhampton manufacturer has devised a method of utilizing the waste of galvanized iron, which is described as follows: He prepares from the skimmings of the zinc pots which are used in galvanizing iron an oxide of zinc containing a large percentage of pure zinc oxide by mixing the said skimmings with carbonate, oxide, or hydrate of calcium, or of other alkaline earths, or the fixed alkalies, and heating the mixture in a retort or other suitable vessel sufficiently to cause a decomposition, resulting in the production of zinc oxide and a chloride of the alkaline earth, or alkali soluble in water. He then separates the soluble substances from the insoluble zinc oxide by treatment with water. Otherwise, instead of heating the mixture as described, he boils it in water and obtains a similar result, when, after allowing the zinc oxide to subside, he draws off the water containing the soluble substances, and washes the zinc oxide with water to separate more thoroughly the soluble impurities therefrom. After the production and purification of the zinc oxide by either method it is dried for smelting or other purposes. The compound of ammonia given off during either process may be utilized. Those of the carbonates which are insoluble in water are not so effectual or convenient in the boiling process as in the heating process.

HOW TO PREVENT HIGH GAS BILLS.—This following, from the *Scientific American*, may direct some manufacturers to the road to economy in the matter of light: There are various other causes of high gas bills, which the household might well look to, but into which we cannot enter in any detail here. Prominent among these are the burners, a poor one of which may easily burn double the gas and not give half the light of one properly constructed. The ordinary type of burner, besides, burns out; and through the enlargement of its orifice, soon becomes very wasteful of gas. Another cause of waste is due to people trying to read or work by several lights located in a high chandelier or fixture instead of by one light brought near them. A single burner, one foot distant from the page of the book, will shed on that page 38 times more light than the same burner six feet away; or, in other words, the single burner located as first stated, will light the page as brilliant as six chandeliers, of six burners each, hung six feet from the book. The absolute quantity of light is the same at all distances, but is spread out over an area which increases with the square of the distance from the flame; so that it is obvious that lights are used very wastefully when they are placed far from the object which they are to illuminate.

GOOD HEALTH.

Diet Dispensaries.

In New York and Brooklyn, and probably in other large cities, diet dispensaries have been of signal benefit to a large class of needy and deserving people. In health the working classes can eat almost anything; but in sickness, unable to earn their daily bread, and quite ignorant of the way to prepare diet for invalids, they suffer as much from the want of knowledge as from the lack of means. Every intelligent person knows that recovery from illness depends more upon food and careful nursing than upon medicine; indeed, the conviction is growing in the public mind, as it should, that strict conformity to the rules of hygienic living would obviate the necessity for medicines, and dismiss to other professions the majority of medical men. There are many who depend upon such means as diet, nursing, sleep, and judicious exercise to restore the sick without resorting at all to so-called medicines. In this class are many physicians, who give indeed bread pills, harmless tinctures, and skillfully compounded innocent mixtures to satisfy the patient, and insist upon the utmost regularity in diet, sleep, bathing, and exercise, relying upon these agencies and the recuperative powers of nature to effect a cure. To reach out a helping hand to all who need, these diet dispensaries have been established. A depot is opened for the distribution of supplies, which are given only to those who bring an order setting forth the peculiar needs of the applicant from a physician approved by the managers of the dispensary. The food furnished consists of beef tea, broths and such diet as may be required, prepared from the best of material, in a cleanly and wholesome manner, under the direction of a master of experience and skill, who is under the supervision of a committee of ladies from the board of managers. The funds needed to carry on these institutions are obtained from memberships, from contributions, and from moneys realized from fairs and festivals held for the purpose. An officer of the society visits those who are recipients of diet, and, if they are needy, makes their case known and relieves them so far as is

in her power by private aid, not from the funds of the dispensary. Those who desire to purchase diet for invalids can do so on reasonable terms, the proceeds going into the general fund.

• There are many towns and villages containing a large manufacturing population where an institution of this character would do a great deal of good; as much to those actively engaged in the work as to the recipients of the benefit. "It is more blessed to give than to receive," and they who imitate the Great Physician in doing good to the bodies as well as the souls of men, receive more than they give.

The Danger of Eating too Much.

"Nobody ever repented of eating too little," was the sage remark of an old gentleman on the verge of 90, next to whom the writer had the pleasure of sitting at dinner the other night. The host was pressing him to take more and urging him in the usual phrase, "Why, you have eaten scarcely nothing!" Now, it is to be assumed that the old gentleman's words indicated one of the by-ways to good health, along which he had traveled through his long life, and to which he owed his present remarkably hearty condition; so it was suggested to him interrogatively that he had always been a small feeder. "Yes," he answered, "ever since I was two or three and twenty; up to that time I was a weakly young fellow enough, and I used to make the great mistake of trying to eat and drink as much as I could, in the hope of becoming strong. All my friends and the doctors barked me in my error; but fortunately I found it out in time and 'knocked off'—as your modern slang has it—more than half my usual amount of stimulants. I gave up the idea of making myself strong, and merely strove to make myself well, and I was contented with eating just as much as I could digest and no more. Of course it took a little time and experience to discover the precise limits; I could not adopt the golden rule of always leaving off with an appetite, because I never began with one, but by persistently erring on the right side, I got hold of one of the great secrets of life—the secret of knowing when one has enough, and after a year or two I became so much better that I used to find myself ready to eat a meal at any time, and by degrees actually acquired an appetite. Then, once found, I never destroyed it, but always determinately rose with the feeling that I could eat more. Naturally temptation grew stronger, but I was firm. I did not behave ungratefully to my stomach and immediately presume upon its increased powers by overloading it. I did not live to eat, but only eat to live; and behold me! I have no need to be very particular as to what I eat, even at my time of life; I have only to be careful not to eat too much." Here, indeed, is the great secret of a great deal that is amiss with many of us. We are in the habit of eating too much, more than our digestive powers can tackle, and that which is not assimilated more or less poisons. The system becomes overcharged and gives any latent tendency to disease within us every faculty for developing itself. The question is not so much what to eat as what quantity to eat, and nothing but a sharp lookout kept by ourselves can give us the answer.—*Tinsley's Magazine*.

A Reason for Cleanliness.

Poisons in the Air.

Pasteur, in his recent experiments on spontaneous generation has demonstrated that the germs of low organisms, bacteria, micrococci, etc., are everywhere present in the air; they settle on the skin, in the air passages, etc., and are ready to become developed in all cases where there is no individual vitality which prevents the growth of the inferior organisms, of which they are the seeds. Healthy people therefore will resist their ravages, but weak, sickly, and especially dead bodies, will soon be the victims of their destructive action. The air in hospitals contains myriads of them, and besides dried pus globules, spores of epithelial parasites emanating from diseased parts, and which are so volatile or light by reason of their almost infinitesimalism, that they hover continually in the air. After some time the walls become invested with them, and this makes old sick rooms so unfavorable for restoration of health. To prove this, Pasteur had a square yard of wall in the surgical ward of the Hospital la Pitié, Paris, which intentionally had not been whitewashed or cleaned for two years, washed with a wet sponge, and the liquid of the sponge expressed; one ounce of a black liquid was thus obtained, which, on examination by the microscope, showed large numbers of bacteria, micrococci, epithelial cells, pus globules, red globules, and irregular blackish masses of unknown nature.

Next comes Dr. Esbth, of Zurich, and examines in the same way the sweat from the face, axilla, breast, and thigh, and finds great numbers of bacteria, which appear to originate from minute bodies attached to the hairs in these regions, forming little nodules like accumulations of micrococci.

The lesson conveyed by all this, is: Practice cleanliness about every part of the body; it is not in vain that combing, washing, bathing and rubbing gives a feeling of comfort—this feeling is a hint of nature that the human system needs it.



W. B. EWER..... SENIOR EDITOR.

DEWEY & CO., Publishers.

A. T. DEWEY, OEO. H. STORRE
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Office, No. 224 Sansome St., S. E. Corner
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THE ORIGINAL ARTICLES in this paper are mostly set in solid type, giving in our columns one-third more reading than is contained in ordinary leaded matter.

Our latest forms go to press on Thursday evening.

San Francisco:

Saturday Morning, May 27, 1876.

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MINING STOCK MARKET.—Sales at the San Francisco, Pacific and California Stock Boards; Notices of Assessments; Meetings and Dividends; Review of the Stock Market for the Week, 340.

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DRE CANON MINES.—Concerning the prospect of this place a correspondent of the Salt Lake Tribune says: The snow having nearly all disappeared, and the roads once more become good, mining has started up with renewed activity for this season. The following mines are at work, and show marked improvement: Galsua, Pine Grove, AcBar, Don Pedro, Wandering Jew, Home Stake, Keystone, Joy, Mahogany and Leap Year. Those preparing to start work are the Ontario, Belle Wilbur, May Flower, Seventy-five and Rab Tickler. Taking this camp throughout, there never has been any time when its mines and prospects gave their owners more solid encouragement than at the present time.

MATHEMATICAL.—A correspondent writes the following query for some of our readers to answer: Tell me how to describe the greatest square in a given scalene triangle.

EDITORS PRESS.—Some of your numerous readers may be pleased to give a geometrical demonstration of the following queries: In a given scalene triangle, to inscribe a maximum square? Of all circular segments, the length of whose arcs are equal, which is a maximum?

PEN AND INK.

THE SULPHUR MINES.—This San Francisco sulphur mining company, which incorporated on the McWorthy sulphur mine near Rabbit Hole springs, are now working the sulphur beds systematically. The refining works are in full blast, and turn out on an average five tons of brimstone daily. This is hauled by teams to the Humboldt house, from which place three car loads a week are shipped to San Francisco.—*Silver State.*

CALIFORNIA PUBLICATION.—"Ben Nabo" is the title of a poem recently re-published by its generous spirited author, Hector A. Stuart, Esq., of San Francisco. It is accompanied by several shorter and later publications by Mr. Stuart.

Mines vs. Stocks.

Daily mors and more are the endless resources of our coast developing; our people are, in fact, just commencing to open up and bring to light the vast treasures hidden in our mountains and places California and Nevada in the front rank for mining enterprise in the world.

This mineral deposits of our coast are many and almost inexhaustible, and if they are worked judiciously must in each and every case be of pecuniary advantage to the owners. But there is one hindrance to the development of our section, and we are unable to see any means to remove it, that is the stock gambling. To work a mine is only possible to few individuals who have the good fortune of honanza bank accounts, and for that reason co-operation and stock companies have become a matter of necessity. When these stock companies first started and honest men had the management of them, our people, even the poorest of them, contributed to help enterprises which were the source of everlasting wealth of ourselves and our State. Money was expended fairly and honestly, and the fruits of the mines were given to the stockholders and divided among them. But alas! these times have passed. Our people had become too confident for unscrupulous men to allow their chances to pass. Companies were formed and capital but too easily obtained ostensibly for mining purposes, on ground which did not only never possess any metal-bearing lode, nor ever carry auriferous gravel, but had not even the intrinsic value of land that can bring a good potato crop. Large sums, the proceeds of stock sales and assessments, wandered into the pockets of sharps, and when a dozen of these swindling concerns had vanished, the success of one legitimate undertaking would give rise to another dozen and our people were duped and swindled out of their money till they grew tired of it. But we don't mean to say that all such enterprises were commenced with fraudulent intentions and on ground of absolutely no relative value; to the contrary, many a good mining claim lies to-day in California unworked because its progress was impeded by stock sharps, who, when they saw their game spoiled or were unable to prosecute it any longer, had to let it go, it has become infamous and there it lies covered with grass. And these same stock sharps have acquired a power which is detrimental to our best interests. If a mine is but on the board it is sufficient to furnish the means for the fitting up of costly offices, for the paying of Brussels carpets and princely salaries, sometimes even for the erection of enormous hoisting and reduction works, and many times thousands and thousands were expended for the purpose of teaching at the cost of the company the art of mining to a superintendent who chances to be second or third cousin to the lassing man, but who has never seen a mine before his cousin made the lucky stroke of becoming president. This game has been carried to such a point that our most promising mines are lying helpless for want of co-operation. People are too far in the hands of men who make it a business to gamble in mines or mining stock instead of working them legitimately, and nothing is more characteristic of that than what a stock sharp told us the other day: "If you have bonanza in your mine we on California street can sell your stock at two bits a share if we choose to do so"—and that man did not know silver from a piece of grindstone.

But this time will come when no such humbug nod-raking has any chance of success. Honest mining men make it a point to open the eyes of our fellow citizens, and it will henceforth be one of the objects of the MINING AND SCIENTIFIC PRESS to discard anything coming to our notice that does not bear on its face honesty and probability of success and that does not carry at its head names which guarantee a fair and legitimate expenditure of funds which our people contribute for the development of our section.

REMOVAL OF THE WIRE WORKS.—Among the acquisitions of our thrifty neighborhood are the Hallide wire works, which have removed from 113 and 115 Pine street to No. 412 Clay street, one door below the office of the SCIENTIFIC PRESS. Our friends will be pleased to learn that this establishment has recently increased its manufacturing facilities three-fold, and is now prepared to furnish all kinds of wire work in any quantities desired. Their range of goods is a wide one, embracing many articles in mining, mechanical and housekeeping operations. Many of these articles—the patent endless ropeway for instance—have become famous; while those which are of ordinary use are increasing to an extent which is almost innumerable. The work of this establishment is as famous for its neatness and thorough adaptability as for its superior strength. Most of the special merits of this now celebrated wire works have grown out of the peculiar wants of our situation, and Mr. Hallide, the head of the establishment, has done much toward supplying our special mechanical wants, some of which are of a complicated character. The works of this company have grown with the growth and strengthened with the strength of the mining, mechanical and housekeeping interests of the Pacific coast. It is now one of the largest establishments on this hazy street, and the SCIENTIFIC PRESS is proud to place it on its new list of neighbors.

Virginia City and the Comstock Mines.

NUMBER FOUR.

[By our Resident Correspondent.]

Last week's wandering brought us to the confines of the Sierra Nevada and even encroached a little upon its boundless in speaking of the old Sacramento claim. In speaking of the latter as being abandoned, it was not meant that the claim was abandoned but that work through the old shaft opposite the new works of the Utah had been discontinued. This claim itself is one of a good many that go to make up the 3,600 feet of the Sierra Nevada. This, the Hearst & Meredith, the Alls and a number of others, were consolidated into one company, which hesitates incorporation under the California law with the title of Sierra Nevada S. M. Co. The present officers are John Skes, President; W. W. Stetson, Secretary; W. J. Wright, Superintendent. Capital stock is \$10,000,000 with 100,000 shares. Annual meeting, second Tuesday in January. This is the most northern of the series of parallel claims on the Comstock, and is bordered on the south-west by the Union Consolidated, or rather by a strip of disputed ground which separates the two. The earlier workings of this company consisted of numerous short tunnels and shafts following surface deposits of high grade ores. Subsequently the hoisting works were erected at what is now called the old shaft, which was sunk to the depth of 825 feet. Some drifting was done at 200 and 300 feet, but nothing of importance until at the 700-foot level, within the past year, a drift was run north for 1,300 feet. This was through good looking ledge matter, with well defined walls, varying in width from 25 to 150 feet. The hoisting works at this shaft were considered perfect ten years ago and were ample for all that was then contemplated, which at the utmost was 400 feet. But having reached twice that depth they have come nearly to a limit of a strained capacity. Like nearly all early operators they concluded that the shaft was too far to the west and about two years ago a new one was started 1,400 feet north and 1,100 feet east of the first. Here preparations were made to mine in accordance with the necessities which had developed along the ledge, and hoisting and pumping engines provided for a depth of over 200 feet. The hoisting engine is a single Booth, and is run with a braks. The pumping engine is not used to its capacity, there never having been much trouble from water and almost none at present depth of shaft. Besides these two there is a smaller engine for the machine shop and an air compressor for all the work that is in contemplation. Ingersoll drills are used in the drifts, and a diamond drill is kept constantly at work prospecting ahead. System and cleanliness are decided characteristics about these works and some reader of Milton has posted in a conspicuous place the line "Order is Heaven's first law." This shaft is now nearly 1,700 feet down. There are three levels at depths of 1,000, 1,250 and 1,500 feet, in each of which there are both north and south drifts, and on the 1500 foot level an east drift also. From the 700 foot level of the old shaft an inclined winze is being run to connect with the 1000-foot level of the new shaft for ventilation. Reservoirs of the company's property are being made at this time, and it is supposed that a division into two or more companies is contemplated.

One east of the Sierra Nevada new shaft and in the vicinity of the cemetery, a modest structure denotes the position of the North Consolidated Virginia. It would hardly attract the attention of the visitor who takes note of the elaborate and extensive buildings of the more developed mines, but knowing observers find it worthy of close observation. This was originally two claims, the Spring Garden and the Butcher. The south half was located in 1860, and the north in 1874. In January, 1875, the present company was incorporated in California, with a capital stock of \$10,000,000 divided into 100,000 shares. The officers at present are R. C. Rogers, President; James Maguire, Secretary; D. H. Jackson, Superintendent. Annual meeting, first Monday in February. The north half of this claim is east of the Sierra Nevada, and the south half east of Mexican and Union Consolidated, the south boundary being nearly identical with the north line of the Ophir. The shaft is 1,700 feet from the eastern shaft of Sierra Nevada. It has three compartments, is well timbered and fitted with the most improved hoisting apparatus. The work of sinking the shaft has been prosecuted with the steady purpose of reaching a depth of 1,000 feet before drifting, successfully resisting the temptation to spend money on explorations at lesser depths which would probably result only in gratifying an expensive curiosity. The present depth is 900 feet, and sinking continues with all the speed consistent with economy. At 500 feet the first quartz stratum was found, and several others have been passed through since, varying from six inches to six feet. Most of this was low grade ore—some of it assaying as high as \$17. At the present depth the shaft is passing through quartz, clay and porphyry—the quartz beginning to predominate and exhibiting a clearer and livelier appearance. A double engine, with a capacity for 1,500 feet, does

the hoisting and has hitherto lifted the water; but the excavations are now being made for a pumping engine, which, with its appliances, will be the largest and heaviest now in use in the district, and will only be exceeded by the huge machinery which is about to be used at the Savage and some one or two other mines. Hitherto this water, to the extent of 14,000 gallons in 24 hours, has been handled without interfering with other work by the following ingenious method: At every 200 feet tanks were built, into which the water was conducted, and here it was retained until other work permitted it to be removed. This was done rapidly by means of an iron bucket holding 300 gallons, which was let down and filled from each of the tanks in succession. It is the special claim of this company that the results of their operations are largely above the average in proportion to whole amount of their expenditure. Two assessments have been made, aggregating 75 cents to the share, and up to May 1st the total expenditure was \$64,363.54. The proportion which this outlay bears to the development of the mine may be readily calculated from this account of their operations.

In the opposite direction from the Sierra Nevada, that is, nearly due west, and extending from the base up the side of Cedar hill, is found the ground of the Jacob Little Consolidated company. This is a consolidation of three other old claims with the original Jacob Little, which were the Norton, Bowen and Manhatian. The latter were worked for twelve years, principally by tunnels running into the hill, and at times yielded fair paying ore, which usually contained a large percentage of gold. The consolidation and incorporation was in January, 1875, with capital stock of \$10,000,000 and 100,000 shares. After the consolidation the work was continued by tunneling, the main tunnel running well under the hill, to a distance of over 200 feet. From this drifts were run at various angles, and the northwest drift carried about 200 feet with good prospects of resching pay ore. This was the condition of things in November, 1875, when work was suspended. Since that time nothing has been done, but preparations are now being made to resume at an early date.

There are many other Cedar hill claims upon which more or less work has been done; some of it in earlier times and some more recently, but none with any notable development. The Iowa, Lincoln and Peytona may be named in this class; the last mentioned being the only one upon which any work is being done at present.

The encouraging outlook for the past few weeks all along the Comstock has received no check since my last letter. Everything is bright and full of promise, and some of the developments are striking, but as yet these can only be whispered. An immense amount of work is being done at the mines that are preparing for new and heavier machinery. At the California pan mill the new reservoir is completed, and they are now replacing the old engine by a new one. At the C. C. shaft the engine is being altered from a high to a low pressure. At the Hale & Norcross, the Gould & Curry and the Savage, great numbers of extra men are employed in preparing for and putting up the new pumping machinery. The necessity for retimbering a portion of this 1500-foot level of the Consolidated Virginia has not interfered materially with hoisting ore, and this daily yield is not prospectively lessened. The new superintendent of the Consolidated Virginia and California assay office is Wm. T. Reilly, late assistant assayer in the San Francisco mint.

Virginia, Nevada, May 25th.

Gold-Bearing Slate.

We examined this week some specimens of gold-bearing slate from the Old Hickory mine in El Dorado county. This mine is situated on the North fork of the American river, about 2½ miles from Placerville. The vein is gold-bearing talco-slate, 10 feet wide, and is traceable for miles. There is no quartz in it at all.

The assays from this ledge run, from actual working test, from \$50 to \$100 per ton, but there are several tons on hand mining over \$2,000 per ton. The deposit is quite large. The ledge has been known for a long time, but after it was discovered to hold gold it never paid, owing to the difficulty of working it in the batteries. The gold being evidently covered with a thin film of talco-slate, passes easily over the plates and does not amalgamate. This little film is acted on successfully by an alkali.

The ore is quite peculiar and carries a good deal of sulphurets, besides the free gold. The walls of the vein are perfectly smooth and well formed. It is on a slate formation, but of a different character, of course, from the country rock. A vein of this kind is now being worked with profit in South America, although it is something new here.

The mine has recently been incorporated here by the following gentlemen: E. D. Sawyer (Treasurer), S. F. Shepley (President), A. E. Ball (Secretary), R. P. Clement and E. G. Gaertner. The shaft on the mine is now down 75 feet, and reduction works are now being made to put on the mine. There are several of these slate ledges through the country, but whether others of them are gold bearing or not we do not know.

NECESSARILY DEFERRED.—We have on hand a valuable article—a review of the Mindleff process—which was received too late for this issue. It will appear in the Press of next week.

[Editorial Correspondence.]

The Centennial at Philadelphia.

The Grand Opening.

The inauguration of the great American Centennial exposition, commemorative of the hundredth year of our national existence, is now an accomplished fact. Everything connected with this "opening day" went off as per programme. The President, most of the leading dignitaries of the land, and all the foreign representatives at Washington were present to aid and give dignity and importance to the event. The great American Empire of Brazil was represented by the personal presence of her wise and popular sovereign and his suite. The Emperor preceded the President in his arrival upon the stand, and when the latter arrived, and in the presence of the vast waiting multitudes extended the hand of friendship and recognition to his brother ruler, the shout which went up gave unmistakable evidence of the warmth of friendship and sympathy which exists between the two great leading nations of the American Continent.

The telegraph has informed the world of all the leading incidents of this occasion, and has, no doubt, told the readers of the Press how the dignitaries who were present, immediately after the conclusion of the speaking and singing, passed hastily to machinery hall, where the President, with his own hands, started the great Corliss steam engine, by which the fourteen acres of machinery in that building was set in all its varied and complicated motions. The exposition was, by that crowning act, fully inaugurated and put into practical operation.

Four Days After.

The exposition has now been four days in operation, and the sound of the hammer and the saw is still going on in all directions. In the fortissimo part, the music in the main exhibition room—by Gilmore's band—has decidedly the beat of it; but when it comes down to the low, sweet solos of the cornet or flute, the noise of the artisans at their work is in the ascendant. Trains of cars are constantly arriving, loaded with goods which have been delayed. No less than 50 loaded cars entered the grounds on Thursday, and large numbers arrived on Friday and Saturday. Goods are also arriving by steamers and sailing vessels, and being transferred to the grounds by trucks. It will be many days—some weeks indeed—before all the exhibits are in. It is doubtful if everything will be in perfect order before the fourth of July—the great anniversary day itself.

Still, all except the exhibitors themselves are more than satisfied with the progress which has been made. The display in the various buildings is extremely gratifying. In the main exhibition building, although many sections are still almost bare, or in great confusion, nevertheless the show is extremely rich and elaborate. Nothing ever before seen in this country will bear any reasonable comparison with the richness, taste and variety of the display. Philadelphia compared with London, Paris and Vienna.

Your correspondent has thus far endeavored to employ his time to the best advantage in securing a general idea of the exhibition throughout, with the view of being able to institute some comparison between its extent and that of other similar exhibitions abroad. London, Paris and Vienna have each had their turn, and the two former have repeated their first efforts—London once, Paris twice. A comparison of the statistics of those exhibitions shows favorably for Philadelphia—as far as area of exhibition space is concerned; and so far as your correspondent can learn from those who were present at the various European exhibitions the same advantage holds good in other respects also. The first great world's fair was held in London in 1851. We append a statement of the exhibition area of that and the subsequent European exhibitions, stated in acres and tenths of acres as follows:

England's World's Fair of 1851.....	18.6	acres
Paris " " 1855.....	22.1	"
London " " 1861.....	23.9	"
London " " 1871.....	26.6	"
Paris " " 1867.....	31.0	"
Vienna " " 1874.....	56.5	"
Philadelphia Centennial 1876.....	60.0	"

The Philadelphia Centennial exhibition area is made up as follows:

Main Exhibition Building.....	21.5	acres
Memorial Hall or Art Gallery.....	2.5	"
Machinery Hall.....	14.0	"
Horticultural Hall.....	2.0	"
Agricultural Building.....	10.0	"
U. S. Government Building.....	2.0	"

Total.....62.0 acres

The balance—eight acres—needed to bring up the area to the figure of 60 acres, as given in the first above table, is made up as follows:

The Nevada State building, in which a complete five-stamp quartz mill is shown in operation; a large building, erected by Gillinder & Sons, of Philadelphia, in which is shown the whole process of glass manufacture, melting, blowing, pressing, cutting, etc., with a large display of manufactured ware; the Women's pavilion, devoted to the exhibition of the handiwork of the women of the United States; an extensive building devoted exclusively to the practice and display of the photographic art; a

large building devoted exclusively to the exhibition of osriages, wagons, etc.; also several other minor show buildings, to say nothing of a large amount of open area occupied by the U. S. Government for the display of military field equipments, the field telegraph, etc., which may properly be shown in the open air. These will more than bring up the floor space of this Philadelphia exposition to 60 acres—three and a half acres more than the largest European display, at Vienna, in 1874.

We may in very deed pronounce the exhibition a wonderful success—a real triumph for America. The managers of the exhibition, the people of the State of Pennsylvania, and especially of this city of Philadelphia, may well congratulate themselves that the energy, power and steady endurance which they have manifested during the past two years, against much indifference and all manner of hindrance and even opposition, has at last resulted in a most glorious triumph—a triumph of which the nation may well feel proud, a success which is recorded by the lips of thousands of representative people from every nation on this globe, who are here present to see and report in person.

It is now fully demonstrated that the American Centennial exhibition will prove the grandest collection of the products of human industry, art and taste which has ever been presented to the world. Let us hope, also, that it will prove equally successful as a pecuniary enterprise. If it fails in that particular it will be because the American people cannot or will not appreciate and properly patronize an effort which is eminently worthy of their patronage, and which is capable, by comparing the achievements of our people with those of others, of teaching everything in the way of human handicraft which is useful to learn, or which man, from observation and study, can so attain.

The Centennial Grounds.

Fairmount park, the site of the Centennial grounds, is well known to all who are ac-



SCENE IN TAHITI.

of its form and topography may be learned from the diagram given in the issue of the Press of April 29th. The area is triangular in shape. The distance from one point of the triangle to each of the others is about one mile in a direct line, and considerably over that by following the avenues and paths necessary to be traversed to reach the several points. The main entrance is approached from the city, along Elm avenue, by most of the city street cars, and also by the Pennsylvania Central railroad. The cars of the latter pass their freight trains directly into the grounds, as seen by the diagram aforesaid, between the two offices.

The grounds are entered by 13 different gates, each of which is supplied with a greater or less number of self-registering turnstiles—one entrance, probably, for each of the original 13 States. Only a portion of the entrances are painted in Philadelphia. The portion enclosed comprises about 260 acres. Some idea shown in our diagram. The main exhibition buildings are six in number, and cover, according to the table already given, an aggregate area of over 50 acres. These are supplemented by several other large and pretentious show buildings, some of which have already been mentioned. The total number of buildings within the enclosure is set down at 150, to which others are still being added. The larger number consists of the various State buildings, restaurants, beer and liquor saloons, newspaper offices, etc.

Magnificent Distances.

By further reference to the diagram, and reflection upon the distances and areas given, it will readily be realized that, as an exhibition ground, it is divided by magnificent distances as well as covered with mammoth structures. The nearest practicable distance between the main exhibition building or the machinery building, and the agricultural building, is about half a mile. The Government exhibition building and horticultural hall are also nearly as distant from those mentioned and from each other. Hence a large amount of walking is requisite to simply make the round from one building to another during a single day, to say nothing of treading the avenues and aisles of each separate building. Of these there are 11 miles in the main exhibition building alone.

Conveniences for Getting About.

For the convenience of getting about, a narrow gauge railroad track has been laid, following, as close as possible, a course just inside of the enclosure. By taking the cars upon this track a person may readily pass from one portion of the grounds to another for 10 cents. As a further convenience for getting through the main thoroughfares of the grounds and buildings, a large number, several hundred, of rolling chairs have been provided and stationed at intervals all through the grounds and in the main buildings, which can be hired for 60 cents an hour, or with a large reduction for a longer time, upon which a gentleman or lady can be seated and trundled wherever they may wish. By this means the tired visitor, or even an invalid, may take a leisurely view of the exposition, without the tediousness of personal locomotion, leaving their seat at any time when they desire to take a more close view of any particular object than can be obtained from the chair. One of these chairs can be hired the entire day for four dollars. For the further convenience of visitors, restaurants, beer stands, booths and dairy stands, etc., are placed at close intervals all through the grounds and buildings. Soda, meat, milk, etc., can be had at their proper stands. Pans cold water can also be had now and then from living fountains, so placed as to interfere as little as possible with the profits of the beer sellers. The prices of everything inside the gates is just about double that at the restaurants and saloons outside, on which account the latter appear to be liberally patronized by those who find it necessary to be economical and don't feel like filling their pockets with luncheon from home. Checks are furnished to all who desire to leave the grounds for a short time, good only for that day.

The State Buildings.

Referring once more to our diagram, the most of the various State buildings are ranged along and fronting the winding avenue which

Whitehill of Nevada, Mr. J. P. Woolman, commissioner from Montana, and Mr. Thos. Donaldson, commissioner from Idaho, are in place but not yet labeled, and make a fine show. They will be more fully described in a future letter. These exhibits are in the Government building, adjoining the Smithsonian Exhibition under charge of Prof. William P. Blake, formerly of California.

Mr. J. R. Scapham, in charge of the Central Pacific railroad's California products, curiosities, etc., is fast getting his exhibition into shape. One carload was still to arrive on Saturday.

Mr. Schuman of Woodward's gardens is here, but has not yet got his cases fitted up.

Among other exhibits which I have casually noticed in passing through the building, are photographic portraits from Bradley & Rulofson, Yosemite views from Watkins, portraits from Taber and from Weston, Central American views from Maybridge, and stereoscopic views from Riley.

Gustave Mahe, Kohler & Frohling, M. Keller & Co., exhibit wines. The big California grapevins is here, but no acceptable place has yet been assigned for it. The section of bark from the Big Tree has been set up near the grounds as an outside show.

Judges from the Pacific Coast.

I have just learned that the following persons from California have been appointed as Judges: Irving M. Scott, of San Francisco, on machine tools for iron, wood and stone; J. D. Hagne, San Francisco, on mining and metals; George W. Henston, on India rubber products and goods; Gen. H. M. Naglee, San Jose, on wines; James Bruce, Corvallis, Oregon, on agricultural machinery.

Goods are still coming. A train of seven carloads is now standing on the track near the Press headquarters, where I write. W. B. E. Centennial Grounds, May 15th.

One of Our Notabilities Gone.

Papers all over this State and Nevada have given due notice of the death of one of our notable characters, John A. Thompson, known all over the Pacific coast as "Snowshoe Thompson." He died on Monday of last week at his ranch in Diamond valley, Alpine county, in this State. In the early days of California and Nevada he achieved considerable notoriety as a carrier of the mails between Placerville and Carson valley on snowshoes.

His great natural advantages, physical power, fitness and endurance, were supplemented by a habit of punctuality which made his name as dear as well as familiar in the mouths of the people of this coast as household words. He was born at Upper Tina, Prestigard, Norway, in 1827, which makes him 50 years old at his death. In 1837 he came with his father to the United States, settling in Illinois. Four years later he came across the plains to California, making Placerville his stopping place. His first trip over the Sierras was in 1856. He went from Carson valley, a distance of 90 miles, carrying the mail bags strapped upon his back, the snow lying in some places 50 feet deep; but he made a successful trip over this sea of snow on his long Norwegian snowshoes. He continued to carry the mails between these points all that winter. Several years since he acquired a ranch in Diamond valley, where he resided until his death. The Carson News thus notices his funeral:

"The remains were brought to Genoa Thursday afternoon for interment, followed by a large procession of mourning friends in carriages and horseback. Many of our citizens proceeded up the valley and met the procession. Funeral services were celebrated in the court-house, under the direction of Dr. Killpatrick. Dr. Smith informs us that the deceased was carried off with inflammation of the stomach and bowels, with which he had been afflicted some two months, though the disease had not prostrated him only about eight days."

Tahiti.

We give on this page a pretty scene from Tahiti. As the island is just now filling our markets with its fruits, it will be interesting to our fruit growers and consumers to catch a glimpse of the land whence the fruit comes. An enthusiastic French traveler, writing of the scenes which we illustrate, says:

"The appearance of the shores of Tahiti offers a grand variety of natural beauties. A happy combination of land and water, of precipices, of plains, of trees reflecting the thick foliage upon the limpid waters, of lofty mountains delineating their profiles on the clear sky, gives to the spectator delightful sensations. Thousands of trees produce excellent fruit, which only demand that a man put out his hand to gather them. The landscape is pleasing with the shade of orange and citron trees." We doubt not since the day when the writer visited the island the Tahitians have learned from their commerce that fruit is too valuable to bang where any one could put hand to it, but we have good evidence of the choice fertility of the soil and the bearing of the trees from the stores which ships are almost daily unloading at our wharves.

The Pacific Coast Exhibits are fast assuming shape. The mineral exhibits from California, Nevada, Montana, Idaho, Oregon and Arizona, under charge of Dr. H. R.

On Sunday evening there were violent storms at various points in the Middle and Western States.

PACIFIC MACHINERY DEPOT,

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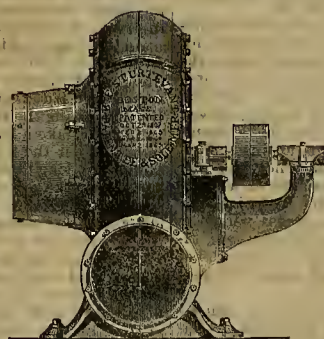
SOLE AGENT FOR THE PACIFIC
COAST FOR

J. A. Fay & Co's Wood-
working Machinery,

Blake's Patent Steam
Pumps,

Tanite Co's Emery Wheels
and Machinery,

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Machinists' Tools,



Sturtevant Exhaust Fan for Remov-
ing Shavings and Sawdust
from Machines.

Sturtevant's Blowers and
Exhaust Fans,

J. A. Roebling's Sons Wire
Rope,

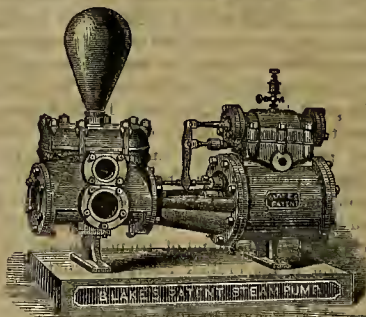
Pure Oak Tanned Leather
Belting,

Perin's French Band Saw
Blades,

Planer Knives,

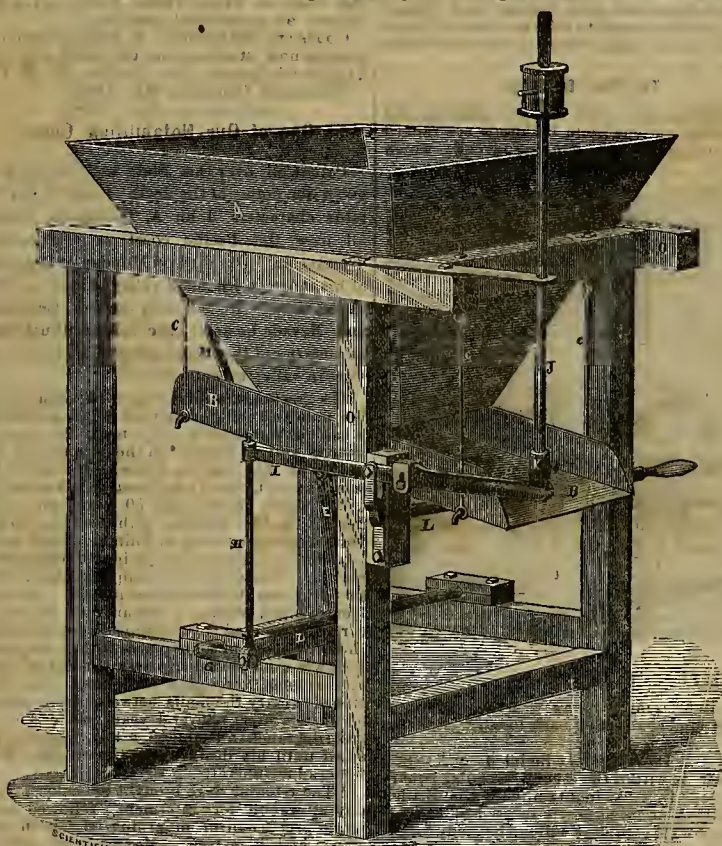
Nathan & Dreyfus' Glass
Oilers, and Mill and
Mining Supplies
of all Kinds.

BLAKE'S PATENT STEAM PUMP



Over 8,500 in Successful Use in the United States.

TULLOCH'S AUTOMATIC ORE FEEDER.



The TULLOCH AUTOMATIC ORE FEEDERS have been practically tested during the last year and a half in twenty-seven mills, of from five to eighty stamps each, and have, in every case, given perfect satisfaction. Refer to the following Mills: California, Con. Virginia, Northern Belle, Leopard, French, Humboldt, Douglas, Phoenix, Hite, Crescent, and others. Prices Reduced. Send for Circulars.

F. OGDEN, Sole Agent,

417 Market Street, San Francisco.

IRON PIPE

FOR GAS, STEAM AND WATER,

Galvanized, Enameled and Black, 1-4 to 12 inch Diameter.

SEAMLESS

LAP-WELDED PUMP COLUMN,

ALL SIZES, TO 15 INCHES DIAMETER.

HYDRAULIC MINING PIPE,

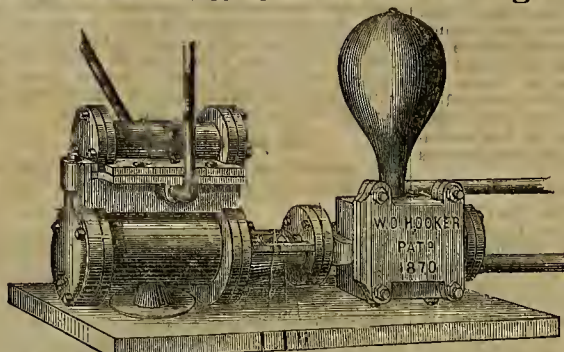
GAS AND WATER MAINS.

FOR SALE BY

DUNHAM, CARRIGAN & CO.,

107, 109 and 111 Front Street, San Francisco.

Hooker's Patent Direct Acting Steam Pump.



W. T. GARRATT,

Cor. Fremont & Natoma
streets, S. F.,

Sole Proprietor & Manu-
facturer for the Pacific
Coast.

SIMPLE, CHEAP AND
DURABLE.

Adapted for all pur-
poses for which Steam
Pumps are used.

The Best Pump in Use.

SEND FOR CIRCULAR

N. B.—Also manufacturer of Hooker's Deep Well and Double-Acting Force Pump. Received the Silver Medal awarded at the last Mechanics' Fair in San Francisco.

FRASER, CHALMERS & CO.
SUCCESSIONS TO EAGLE WORKS MFG. CO. MANUFACTURERS OF

STAMP SHOES
STEAM ENGINES, BOILERS, AND STAMP MILLS
CRUSHING, AMALGAMATING, AND MILLING MACHINERY
ROLLERS, FOR SYSTEMATIC MILLING, SMELTING, AND CONCENTRATION OF ORES

AGENTS FOR
BLAKE STONE BREAKER
JEFFEL & Water Wheel
FLOUR MILL FURNISHING CHICAGO GENERAL MACHINERY

Address, FRASER, CHALMERS & CO., Chicago, Ill.

THORNE, DeHAVEN & CO.

21st Street, above Market,
PHILADELPHIA.

DRILLING MACHINES.

PORTABLE DRILLS. Driven by power in any direction, self-feed and convenient adjustment.

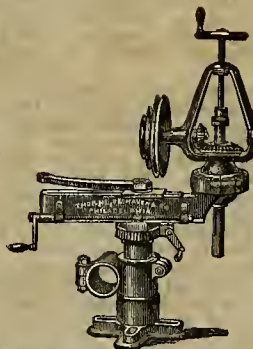
RADIAL DRILLS. Self-feed—large adjustable box table—separate base plate, every convenience.

VERTICAL DRILLS. Self-feeding—of new and improved designs.

MULTIPLE DRILLS. For boiler work, etc., 2 to 20 spindles, fed and returned by power or hand, together or separately.

HORIZONTAL BORING AND DRILLING MACHINES. For large pieces—with boring head, adjustable, vertically and horizontally.

SPECIAL DRILLS. For special work. Gun Blank Drills, Coal Drills, &c., built to order.



BLACK DIAMOND FILE WORKS.



G. & H. BARNETT,

Manufacturers of Files of every Description
Nos. 39, 41 and 43 Richmond street,
Philadelphia, Pa.

Sold by all the principal hardware stores on the Pacific Coast. LINFORTH, KELLOGG & CO., General Agents for the Pacific Coast.

\$5 to \$20 Per Day at home. Terms free. Address G. STINSON & Co., Portland, M.

Diamond Drill Co.

The undersigned, owners of LESCHOT'S PATENT for DIAMOND-POINTED DRILLS, now brought to the highest state of perfection, are prepared to fill orders for the IMPROVED PROSPECTING and TUNNELING DRILLS, with or without power, at short notice, and at reduced prices. Abundant testimony furnished of the great economy and successful working of numerous machines in operation in the quartz and gravel mines on this coast. Circulars forwarded, and full information given upon application.

A. J. SEVERANCE & CO.
Office, No. 315 California street, Rooms 1 and 2.
24v26-tf

San Francisco Cordage Company.

Established 1856.

We have just added a large amount of new machinery of the latest and most improved kind, and are again prepared to fill orders for Rope of any special lengths and sizes. Constantly on hand a large stock of Manila Rope, all sizes; Tanned Manila Rope; Hay Rope; Whale Line, etc., etc.

TUBBS & CO.,
611 and 613 Front street, San Francisco



ASHCROFT'S
Steam Gauges.

The very best in the country. A large stock at reduced prices.



ENGINE LATHES, IRON PLANERS,
SHAPERS, POWER DRILLS, ETC.,
IN STOCK.

Belting

MUNSON'S BEST.

Large Stock Always on Hand.

Send for list and discounts, which are ten per cent. below any other dealer.



PERMANENT BLOWING.



NATHAN & DREYFUS'

Self-Oilers and Cylinder
Cups.

Save from sixty to eighty cent.
of oil over the old
method.



Emery Wheels.

WARRANTED

Best in the Market.

For Sale only at **BERRY & PLACE'S MACHINERY DEPOT, San Francisco, Cal.**

LEVI STRAUSS & CO.,

Patent Riveted

Clothing,

14 & 16 Battery St.,
San Francisco.



These goods are especially adapted for the use of FARMERS, MECHANICS, MINERS, and WORKING MEN in general. They are manufactured of the best material, and in a superior manner. A trial will convince everybody of this fact.

Patented May 12, 1873.
USE NO OTHER, AND INQUIRE FOR THESE
GOODS ONLY.

BERRY & PLACE,
San Francisco.

Are the only Agents for sale of these
Levi's in the Pacific States.

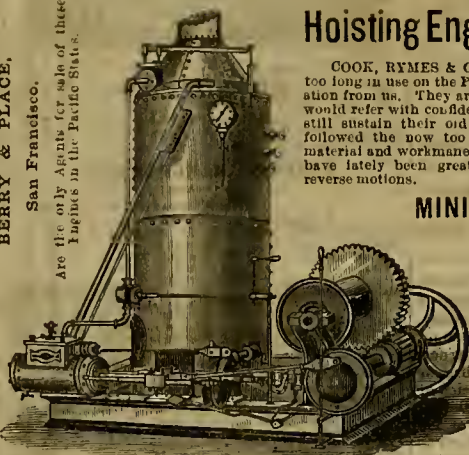
Hoisting Engines. Mining Engines.

COOK, RYMES & CO.'S celebrated Hoisting Engines have been too long in use on the Pacific coast to require any special recommendation from us. They are well known from Alaska to Mexico. We would refer with confidence to any one of the hundreds in use. They still sustain their old reputation, the manufacturers not having followed the now too common practice of reducing the quality of material and workmanship to compete with cheaper engines. They have lately been greatly improved by adding large drums, and reverse motions.

MINING HOISTING ENGINES.

(Manufactured by the same parties.)
Our new Mining Engine is built from plans and specifications of several of our most successful MINING ENGINEERS, and the result is the most complete
Double Drum Hoisting Engine
Ever built. Their advantages will be seen at a glance by any one familiar with the necessities of a mine. These engines may be seen in use in Ophir, Con. Virginia, Chollar, Europa, Niagara, Leviathan, Phil Sheridan, and several other mines on the Comstock Lode. For sale only at

BERRY & PLACE,
(Successors to Treadwell & Co.)



The Famous "Enterprise"

(PERKIN'S PATENT)

Self-Regulating, Farm
Pumping, Railroad
and Power

WINDMILLS,

Pumps & Fixtures,

Have been in use in California for five years. Over 500 sold in the towns and farming districts of California. All Mills guaranteed. Send for circulars containing sectional and other illustrations, and further description, to

ISRAEL HORTON, Gen'l Ag't Pacific Coast,
Livermore, Alameda County, Cal.



GOLD MEDAL

AWARDED TO

San Francisco Steam Pumps.



AFTER ONE OF THE MOST THOROUGH TRIALS

Ever Had in the United States,

BETWEEN COMPETITORS

—OF—

Best Established Reputation,

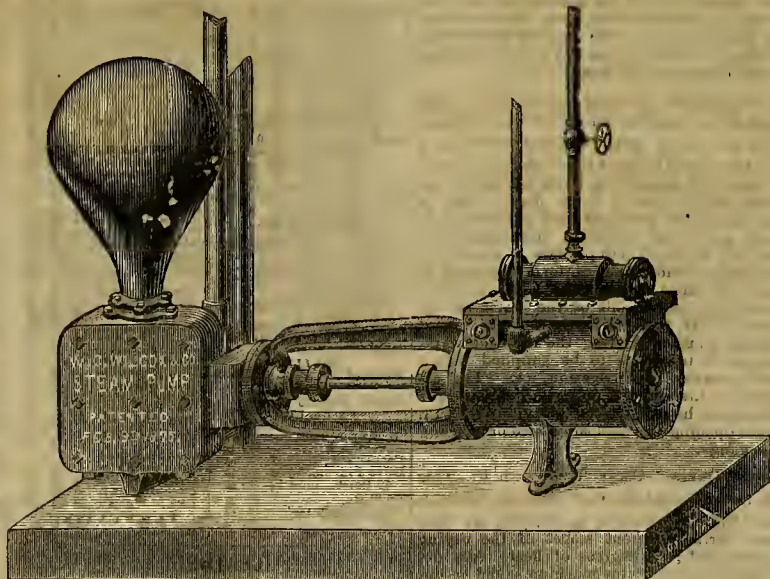
In which, at great expense, the different Steam Pumps were tried under every test known to experts, the Examining Committee of the Tenth Industrial Fair of the Mechanics' Institute have awarded to us their

GOLD MEDAL

—FOR—

Best Steam Pumps on Exhibition.

We claim that our Pumps are the best ever made in simplicity of construction, economical use of power, durability and perfect adaptability for general uses, and we ask all persons interested to investigate our title to this claim.



We are prepared to furnish PUMPS UNDER CONTRACT, guaranteeing their ability to perform any specific work for which steam pumps are adaptable, such as

RAISING WATER FROM MINES,

FOR WATER WORKS,

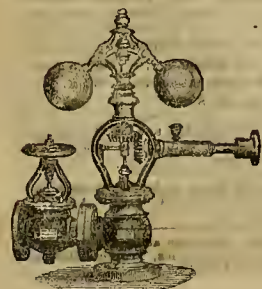
FEEDING BOILERS, RAISING WATER FROM WELLS; STEAMER AND SHIP PUMPS, ETC.

We would also call the attention of those interested, to our Direct Acting Deep-Well Pumps for raising water from

Any Desired Depth.

Also to our Especial Construction of Pumps FOR HANDLING QUICKSILVER or heavy liquids.

W. C. WILCOX & CO., Proprietors.



Judson Standard Governor,

The BEST & MOST RELIABLE
IN USE.

Send for Circular and Price List to

H. P. GREGORY & CO.,

Sole Agents for Pacific Coast,

14 and 16 First street, San Francisco, Cal.

Giant Powder.

Patented May 26, 1868.

THE ONLY SAFE BLASTING POWDER IN USE.

GIANT POWDER, NO. 1,

For hard and wet Rock, Iron, Copper, etc., and Submarine Blasting.

GIANT POWDER, NO. 2,

For medium and seamy Rock, Lime, Marble, Sulphur, Coal, Pipe Clay and Gravel Bank Blasting, Wood, etc. Its EXCLUSIVE use saves from 30 to 60 per cent. in expenses, besides doing the work in half the time required for black powder.

The only Blasting Powder used in Europe and the Eastern States.

BANDMANN, NIELSEN & CO.,
General Agents, No. 210 Front Street,

v22-3ml6p

Banking.

The Merchants' Exchange Bank
OF SAN FRANCISCO.

Capital, Five Million Dollars.

A. HAYWARD.....President
C. W. KELLOGG.....Vice-President.
H. F. HASTINGS.....Manager.
E. N. VAN BEUNT.....Cashier.BANKING HOUSE,
No. 423 California street, San Francisco.KOUNTZE BROTHERS, BANKERS,
12 WALL STREET, NEW YORK.Allow interest at the rate of Four per cent. upon
daily balances of Gold and Currency.
Receive consignments of Gold, Silver and Lead
Bullion, and make Cash advances thereon.
Invite Correspondence from Bankers, Mining
Companies, Merchants and Smelting Works.

French Savings and Loan Society,

411 Bush street, above Kearny..... SAN FRANCISCO
4721st G. MAHE, Director.

Business Directory.

J. H. PAGE, J. S. WILSON, WM. E. HALE,
Late John Taylor & Co. Mem. S. F. Board

HALE, PAGE & WILSON,

Commission Stock Brokers, 429 California Street, S. F.
Money Loaned on Leading Stocks.

OILES H. GRAY, JAMES M. HAVEN.

GRAY & HAVEN,
ATTORNEYS AND COUNSELORS AT LAW
in Building of Pacific Insurance Co., N. E. corner Cal
ifornia and Leidesdorf streets,
SAN FRANCISCO.BARTLING & KIMBALL,
BOOKBINDERS,
Paper Rulers and Blank Book Manufacturers.
505 Clay street, (southwest cor. Sansome),
2-3m SAN FRANCISCOASBESTOS
COATING
FOR
STEAM BOILERS, PIPES, ETC.U. S. & FOREIGN
Salamander Felting Company.PACIFIC BRANCH,
SEWARD COLE, - Manager,
OFFICE, 317 California street, S. F.

FACTORY, Berry street, bet. 4th and 5th, S. F.

NEVADA AGENCY, 38 North O street, Virginia.

INDESTRUCTIBLE NON-CONDUCTOR OF HEAT
Saves 15 to 30 per cent. in Fuel.REFERENCE: U. S. Government buildings and principal
manufacturing establishments in the East and on
the Pacific slope; principal mines and mills in Nevada.Agents for H. W. JOHNS' Patent
Asbestos Roofing and Paints
FIRE AND WEATHER PROOF.Asbestos Steam Packing,
Made from Pure Long Fiber Asbestos,

INDESTRUCTIBLE! SELF-LUBRICATING!

Keefe's Boiler Compound,

Prevents the formation of Scale in Boilers and removes
the same, without injuring the iron or
causing the water to foam.

Circulars, Descriptive Pamphlets, etc., Sent Free.

UNKNOWN.—We have lately received cash at this
office without due explanation, as follows: From Cer-
son, Nev., \$4, by express.The senders will please give full address, date of
sending, etc.

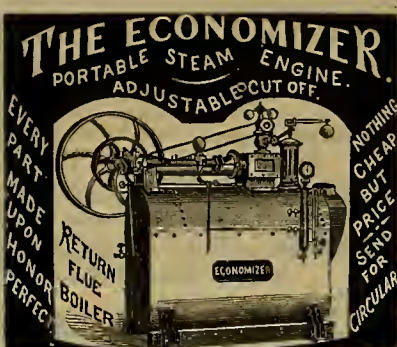
Machinery.

The Ingersoll Rock-Drill



Is Extensively Used in the East and

TAKES THE PLACE OF ALL OTHERS.

Wherever introduced, because it can be run with less
power, labor and expense, and do more work than any
other Drill in the market. It has but few parts, is easi-
ly handled, being light, and HAS AUTOMATIC FEED,
which saves labor. WE ASK FOR TRIAL AGAINST
ANY COMPETITOR. For particular information re-
garding Drills or Air Compressors, send for circular toJ. B. REYNOLDS,
320 Sansome Street

—FOR—

Cotton Gine, Printers, Cheese Makers,
Laundries, Cabinet Makers, and All
Manufacturing where Light
Power is Required.

A. L. FISH & CO.,

Sole Agents for California,

9 and 11 First Street, - - San Francisco.



THE O'HARRA

CHLORIDIZING FURNACE.

Guaranteed to Chloridize from 85 to 95 per cent. of
any gold or silver ores that are not more profitable for
smelting. Will also desulphurize ores and put them in
proper shape for working in cupola furnaces.Cost of Roasting and Chloridizing by this
Process:Two cords of wood at \$6.....\$12.00
Two firemen at \$4.....8.00
1500 lbs of salt at 1 1/2c.....22.50
Wear of shoes and power.....1.50Cost for 15 tons.....\$44.00
Cost for one ton.....2.93 1/3In a furnace of three or four times this capacity the
cost is decreased by 20 per cent.The furnace is now working successfully at the Poe
Consolidated Co.'s mines, in the Peavine District. For
further information, apply toD. J. O'HARRA,
Reno, Nevada.W. F. & JNO. BARNES,
Manufacturers of
Barnes' Patent Foot-Power
Machinery, Scroll-Saw,
Circular Saw, Lathes, etc.
The only Foot-Power Machine without
crank or dead centers. \$1,500 to \$2,000
per year made using these Ma-
chines. Send for Illinois Catalogue
Rockford, Winnebago county, Ill.

Metallurgy and Ores.

JOHN TAYLOR & CO.,

IMPORTERS OF AND DEALERS IN
ASSAYERS' MATERIALSChemical Apparatus and Chemicals, Drug-
gists Glassware and Sundries, etc.

512 and 518 Washington street, SAN FRANCISCO

We would call the special attention of Assayers
Chemists, Mining Companies, Milling Companies
Prospectors, etc., to our large and well adapted stock

ASSAYERS' MATERIALS

—AND—

Chemical Apparatus,

Having been engaged in furnishing these supplies since
the first discovery of mines on the Pacific Coast.
Our Gold and Silver Tables, showing the value
per ounce Troy at different degrees of fineness, and vel-
nabla tables for computation of assays in Grains and Gram-
mes, will be sent free upon application.

7v25-4f

JOHN TAYLOR & CO.

Nevada Metallurgical Works,

21 First street.....San Francisco

Ores worked by any process.
Ores sampled.
Assaying in all its branches.
Analysis of Ores, Minerals, Waters, etc.
Plans furnished for the most suitable pro-
cess for working Ores.
Special attention paid to the Mining and
Metallurgy of Quicksilver.

E. HUH,

C. A. LUCKHARDT,

Mining Engineers and Metallurgists.

RODGERS, MEYER & CO.,

COMMISSION MERCHANTS.

ADVANCES MADE

On all kinds of Ores, and particular attention

PAID TO

CONSIGNMENTS OF GOODS.

4v16-3m

Instructions in Assaying,

Chemical Analysis, Determination of Minerals, and
use of the Blow-pipe.

HENRY G. HANKS

Will receive a few pupils at his new laboratory, 517
Montgomery street, np-stairs. TERMS MODERATE

QUICKSILVER FLASKS,

Tested to 1,000 lbs. per Square Inch,

For Sale in Lots to Suit, by

DUNHAM, CARRIGAN & CO.

LEOPOLD KUH,

(Formerly of the U. S. Branch Mint, S. F.)

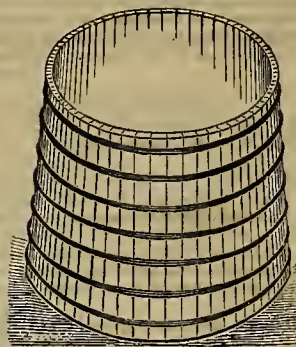
Assayer and Metallurgical
CHEMIST,

No. 611 Commercial Street.

(Opposite the U. S. Branch Mint

SAN FRANCISCO CAL., 7v21-3m

STRONG & CO.,

ASSAYERS AND METALLURGISTS,
10 STEVENSON STREET, S. F.WATER TANKS of any capacity, made entirely
by machinery. Material the best in use; construction
not excelled. Attention, dispatch, satisfaction. Cos
less than elsewhere.

WELLS, RUSSELL & CO.,

Mechanics' Mills, Cor. Mission & Fremont Streets

3v25-3m-aa

THE MINING AND SCIENTIFIC PRESS is one the best
papers published on this coast. It should be in the
hands of every miner and mechanic in the State. The
issues of last week contained an excellent article on the
old product of this coast.—Oroville Mercury, Jan. 28.

Mining and Other Companies.

Amador Canal and Mining Company.

Location of principal place of business, San Francisco,
Cal. Location of works, Jackson, Amador County, Cal.
Notice is hereby given, that at a meeting of the Board of
Directors, held on the ninth day of May, A. D. 1876, an
assessment, No. 1, of three dollars (\$3.00) per share was
levied upon the capital stock of the corporation, payable
immediately, in U. S. gold coin, to the Secretary, at the
office of the company, room No. 2, 418 California street,
San Francisco, Cal.Any stock upon which this assessment shall remain un-
paid on the 15th day of June, 1876, will be delinquent, and
advertised for sale at public auction, and unless payment
is made before, will be sold on Wednesday, the fifth day
of July, 1876, to pay the delinquent assessment, together
with costs of advertising and expenses of sale. By order of
the Board of Directors. J. W. CLARK, Secretary.Office, Room No. 2, 418 California street, San Fran-
cisco, Cal.

Hope Quicksilver Mining Company.—Lo-

cation of principal place of business, San Francisco,
California. Location of works, Cinnabar Mining District,
Sonoma County, California.Notice is hereby given, that at a meeting of the Board of
Directors, held on the 12th day of May, 1876, an assess-
ment (No. 1) of three (3) cents per share was levied upon the
capital stock of the corporation, payable immediately, in
United States gold coin, to the Secretary, at the office
of the company, room 2, No. 408 California street, San
Francisco, California.Any stock upon which this assessment shall remain un-
paid on the 15th day of June, 1876, will be delinquent, and
advertised for sale at public auction, and unless pay-
ment is made before, will be sold on Monday, the 10th day
of July, 1876, to pay the delinquent assessment, together with
costs of advertising and expenses of sale.

A. O. B. HARDY, Secretary.

Office, Room 2, No. 408 California street, San Francisco,
Cal.

Lady Franklin Gold and Silver Mining Co.

Location of principal place of business, 507 Mont-
gomery street, San Francisco, Cal. Location of works,
Silver Mountain Mining District, Alpine County
California.Notice.—There are delinquent upon the following
described stock, on account of assessment, (No. 14)
levied on the third day of April, 1876, the several amounts
set opposite the names of the respective shareholders,
as follows:

Names.	No. Certificate.	No. Shares.	Amount.
James Wilson.....	236	5	\$ 2 50
James Wilson.....	250	5	2 50
Donald Davidson.....	136	10	5 00
Donald Davidson.....	137	10	5 00
Donald Davidson.....	133	5	2 50
Donald Davidson.....	267	102 1/2	51 25
Donald Davidson.....	258	13	6 50
T S Beaver.....	106	10	5 00
T S Beaver.....	287	10	5 00
Alexander Martin.....	266	100	50 00
Alexander Martin.....	267	100	50 00
Alexander Martin.....	268	84 1/2	42 25
Alexander Martin.....	283	30	15 00

And in accordance with law, and an order of the

Board of Directors, made on the third day of April,

1876, so many shares of each parcel of said stock as

may be necessary, will be sold at public auction, at the

office of the Company, 507 Montgomery street, at San

Francisco, California, on Monday, the fifth day

of June, 1876, at the hour of one o'clock, P. M., of said

day, to pay said delinquent assessments thereon, to-
gether with costs of advertising and expenses of the
sale.

F. E. LUTY, Secretary.

Office, 507 Montgomery street, San Francisco, Cal.

Mariposa Land and Mining Company

Location of principal place of business, San Francisco,
Cal. Location of works, Mariposa

County, Cal.

Notice is hereby given, that at a meeting of the Board of
Directors, held on the second day of May, 1876, an assess-
ment (No. 5) of one dollar per share was levied upon the
capital stock of the corporation, payable immediately, in
United States currency, to the Secretary, at the office of
the company, No. 309 Montgomery street, room 33, Nevada
Block, San Francisco, Cal., or to the Assistant Secretary,
at the office, No. 8 Nassau street, New York.Any stock upon which this assessment shall remain un-
paid on the third day of June, 1876, will be delinquent, and
advertised for sale at public auction, and unless pay-
ment is made before, will be sold on Friday, the 30th day
of June, 1876, to pay the delinquent assessment, together
with costs of advertising and expenses of sale. By order of
the Board of Directors. LEANDER LEAVITT, Secretary.Office, Room 33 Nevada Block, No. 309 Montgomery
street, San Francisco, Cal.

Taylor Mill and Mining Company.—Prin-

cipal place of business, City and County of San Fran-
cisco, Cal. Location of works, Garden Valley Mining
District.Notice is hereby given that at a meeting of the Board of
Directors, held on the fifteenth day of May, 1876, an as-
sessment of twenty (20) cents per share was levied upon
the capital stock of the corporation, payable immediately
in United States gold and silver coin, to the Secretary at
his office, 601 Montgomery street, San Francisco, Cal.Any stock upon which this assessment shall remain un-
paid on the twenty-first day of June, 1876, will be delinquent,
and advertised for sale at public auction, and unless pay-
ment is made before, will be sold on Thursday, the sixth
day of July, 1876, to pay the delinquent assessment, to-
gether with costs of advertising and expenses of sale.

SAMUEL S. MURPHY, Secretary.

Office, 601 Montgomery street, San Francisco, Cal.

THE MINING AND SCIENTIFIC

PRESS PATENT AGENCY was estab-

lished in 1860—the first west of

the Rocky Mountains. It has

kept step with the rapid march

of mechanical improvements.

The records in its archives, its

constantly increasing library, the

accumulation of information of

special importance to our home

inventors, and the experience of

its proprietors in an extensive and

long continued personal practice

in patent business, affords them

combined advantages greater

than any other agents can possi-

bly offer to Pacific Coast inven-

tors. Circulars of advice, free.

Address,

DEWEY & CO.,

U. S. and Foreign Patent So-

licitors, office of the MINING AND

SCIENTIFIC PRESS and PACIFIC

RURAL PRESS, S. F.

Iron and Machine Works.

WM. HAWKINS. T. G. CANTRELL
HAWKINS & CANTRELL,
MACHINE WORKS,
 210 & 212 Beale St.,
 Near Howard, - - - SAN FRANCISCO.
 MANUFACTURERS OF
 Steam Engines and all kinds of Mill
 and Mining Machinery.
 Also manufacture and keep constantly on hand a
 supply of our
 Improved Portable Hoisting Engines,
 From Ten (10) to Forty (40) Horse Power.
 N. B.—Jobbing and Repairing done with Dispatch.

**FULTON
Foundry and Iron Works.**

HINCKLEY & CO.,
 MANUFACTURERS OF
STEAM ENGINES.
 Quartz, Flour and Saw Mills,
 Hayes' Improved Steam Pump, Brodie's Im-
 proved Crusher, Mining Pumps,
 Amalgamators, and all
 kinds of Machinery.
 N. E. corner of Tehama and Fremont streets, above
 Howard, San Francisco.

**THE RISDON
Iron and Locomotive Works,**

INCORPORATED.....APRIL 30, 1868.
 CAPITAL.....\$1,000,000.
 LOCATION OF WORKS:
 Corner of Beale and Howard Streets,
 SAN FRANCISCO.
 Manufacturers of Steam Engines, Quartz and Flour
 Mill Machinery, Steam Boilers, (Marine, Locomotive
 and Stationary), Marine Engines (High and Low Pres-
 sure). All kinds of light and heavy Castings at lowest
 prices. Cams and Tappets, with chilled faces, guaran-
 teed 40 per cent. more durable than ordinary iron.
 Directors:
 Joseph Moore, Jesse Holladay, C. E. McLane,
 Wm. Morris, Wm. H. Taylor, J. B. Haggin,
 James D. Walker.
 WM. H. TAYLOR.....President
 JOSEPH MOORE.....Vice-President and Superintendent
 LEWIS B. MEAD.....Secretary
 247-25
 THOS. PENDERGAST. HENRY S. SMITH.

ÆTNA IRON WORKS.

MANUFACTURERS OF
IRON CASTINGS
 and **MACHINERY,**
 OF ALL KINDS.
 Fremont Street, bet. Howard and Folsom.
 SAN FRANCISCO.

**SHEET IRON PIPE.
THE**

Risdon Iron and Locomotive Works
 Corner Howard and Beale Streets,
 Are prepared to make SHEET IRON AND ASPHALTUM
 PIPE, of any size and for any pressure, and contract to
 lay the same where wanted, guaranteeing a perfect
 working pipe with the least amount of material.
 Standard sizes of railroad Car Wheels, with special
 patterns for Mining Cars. These small wheels are made
 of the best Car Wheel Iron, properly chilled, and can be
 fitted up with the improved axle and box—introduced by
 this company, and guaranteed to outlast any other
 wheels made in this State.
 All kinds of Machinery made and repaired.
 24v22-3m JOSEPH MOORE, Superintendent.
Miners' Foundry and Machine Works,
 CO-OPERATIVE,
 First Street, bet. Howard and Folsom, San Francisco.
 Machinery and Castings of all kinds.
McAFEE, SPIERS & CO.,
BOILER MAKERS
 AND GENERAL MACHINISTS,
 Howard between Fremont and Beale, st., San Francisco

**Schofield's
SULPHURET CONCENTRATOR.**

THE BEST MACHINE IN USE FOR
 SAVING SULPHURETS.

No Power Required to Run it, and only a Small Stream of
 Water under a Light Pressure.

ECONOMICAL,
 EFFECTIVE,
 DURABLE,
 AND SURE IN OPERATION.

The especial attention of parties erecting new mills is called to this
 Valuable Improvement.

WE GUARANTEE THAT THIS MACHINE WILL SAVE NINETY PER CENT. OF ALL THE SULPHURETS
 IN THE ROCK AT A MERELY NOMINAL EXPENSE. IT HAS NOW STOOD THE SEVERE
 PRACTICAL TESTS OF OVER A YEAR'S WORK AT DIFFERENT MILLS
 ON THIS COAST, AND HAS BEEN EMINENTLY
 SUCCESSFUL IN EVERY CASE.

The following letters, from practical men who have used this machine, will show to
 those interested what it has accomplished:

BANDERETA MINE,
 Mariposa County, Feb. 7th, 1876.

CHAS. SCHOFIELD, Esq.—Dear Sir: We have been using your Concentrator at our mill
 about six months, and find that it saves over 90 per cent. of the sulphurets contained in the ore,
 and all of the amalgam and quicksilver which escapes from the battery. The machine is simple
 in construction, perfect in operation, and requiring no power to run it, is very economical. I
 can confidently recommend it to all mill men as the best and cheapest Ore Concentrator now in
 use.
 Yours respectfully, LEVI NOEYS, Superintendent.

NONPAREIL GOLD MINING CO.'S WORKS,
 Deer Flat, Tuolumne County, Cal., April 12th, 1876.

MR. CHARLES SCHOFIELD—Dear Sir: It is four months since the Sulphuret Concentrator
 you furnished our company's mill with was first put in operation, and during the past three
 months has been nearly in constant use. The men attending the Concentrator having acquired
 by practice a thorough knowledge of its workings, there is nothing more to be desired; it is
 perfect. A number of mill men have examined the Concentrator and its workings, and pro-
 nounce it the most simple in its construction, perfect in its work, and cheaply run of any they
 had seen. If you think by showing this it will assist you in disposing of your Sulphuret Con-
 centrators, you are at liberty so to do, as it will afford me much pleasure in having contributed
 my little mite towards rewarding true merit. Hoping you will meet with complete success,
 I remain yours truly,
 JOS. J. DOPRAT, Superintendent.

CON. ALABAMA M. CO.,
 Tuolumne County, May 1st, 1876.

C. SCHOFIELD, Esq.—Dear Sir: The Concentrating Machine recently purchased of you is
 now in active operation, and we are highly pleased with it. It saves over 90 per cent. of our
 sulphurets, and is run with very little expense. We could not afford to be without it, and can
 safely recommend it to all mill men as the best and most economical machine in use.
 M. S. MCCONNELL, Superintendent.

WASHINGTON MINE,
 Mariposa County, Cal.

CHAS. SCHOFIELD, Esq.—Dear Sir: Having had one of your Double Rigged Concentrators
 in use now at this Mill for over a year, I take this opportunity of informing you that it is far
 superior to the old English Buddle we have been using for the last four years, not only in a
 saving of labor, but having a less waste of sulphurets in washing.

We have the machine connected with the tail sluice, and receives the sand and water direct
 from the batteries, without any handling, and it does the concentration for the 20 stamps easy,
 with a loss of less than 10 per cent.

Two Chinamen do all the work required—one night and the other day—working 12 hours
 each, and get out about a ton each day, thus concentrating 30 tons into one, at a cost of less than
 four dollars. As the cheapest, most economical and best working Concentrator I know of I can
 recommend it to others without any hesitation.

Yours truly, GEO. E. WEBBER, Jr.,
 Superintendent Washington Mining Company.

MR. SCHOFIELD—Dear Sir: Having carefully examined your Concentrator, which I have
 seen in successful operation at the Francis Company's Mill and also at the Benton Mills, on
 the Mariposa Estate. I have no hesitation in saying that it is the most valuable Concentrator
 I have met with during my long experience as amalgamator in this country. Its manner of
 catching quicksilver and amalgam is thorough and complete, and it saves the sulphurets clean
 and with a loss of less than ten per cent.
 Yours respectfully, L. BURDOW.

MR. C. SCHOFIELD—Sir: I have worked one of your Sulphuret Machines at the Benton
 Mills about 30 days, and am satisfied it is the best machine for saving amalgam and sulphurets
 ever used on the Mariposa Estate.
 L. GILMAN.

The following testimonial is from the well known mining expert, PROF. J. E. CLAYTON:

CHAS. SCHOFIELD, Esq.—Dear Sir: Having followed the business of mining engineering
 for upwards of 30 years, and having had in this connection much to do with regulating machi-
 nery for saving gold and concentrating sulphurets, and having in nearly every mining camp
 on the Pacific Coast examined the various kinds of Ore Concentrators in use, I will say that I
 have nowhere seen anything half as cheap and simple in its construction, scientific in principle
 or effective in operation as your machine.
 J. E. CLAYTON.

Machines can be Furnished at Short Notice. In all Cases we Furnish the
 Concentrator Complete, Set it Up, and Instruct the Buyers as to
 the Proper Way of Managing It.

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 59, NEVADA BLOCK, SAN FRANCISCO.

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Rolling Mill Company,**

SAN FRANCISCO, CAL.
 Established for the Manufacture of
RAILROAD AND OTHER IRON
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 Steamboat Shafts, Cranks, Piston and Con-
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HAMMERED IRON
 Of every description and size.
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 The highest price paid for Scrap Iron.

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IRON FOUNDERS.
 Quicksilver Condensers and Furnace Castings.
 Sole manufacturers of the Hepburn Roller Pan
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 MANUFACTURERS OF
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 And all kinds of Mining Machinery.
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 Sole Proprietor and Manufacturer of the
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 Plumbers' Force Pumps.
 Special attention paid to Brewers', Distillers', Beer
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 attention paid to AIR PUMPS, also to
DIVERS' SUBMARINE PUMPS.
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 OF ALL KINDS OF CAR WORK,
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 All kinds of Brass, Composition, Zinc, and Babbitt Metal
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 Nails, Rudder Braces, Hinges, Ship and Steam Boat Bolts
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 nections of all sizes and patterns, furnished with dispatch.
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 Persons engaged in the following business can have
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THE BUCKMINSTER ROCK DRILL.

The Most Efficient Rock Drill in the Market.

LIGHT, STRONG and DURABLE.

No External Machinery Liable to Injury from Rough Usage, as all the Working Parts are Enclosed in the Cylinder and Valve Chest.

A TRUE SMOOTH HOLE EVERY TIME. THE MOST ECONOMICAL DRILL YET MADE.

THE WORKING PARTS OF THE DRILL ARE FEW AND SIMPLE IN ARRANGEMENT, SO THERE IS NO LIABILITY OF INJURY. THE CLAMPS FOR HOLDING THE DRILL ON THE TRIPOD, FOR HOLDING

THE DRILL TOOL IN POSITION, AND FOR FIXING THE WEIGHTS

ON THE LEGS OF TRIPOD, ARE ALL IMPROVED

AND VERY EFFECTIVE.



The device for rotating this Drill has few parts, and can not get out of order. There is no chance for wear. The motion is positive, and never fails of action. The Drill Carriage can be turned clear round the column, and can also turn in a complete circle on the head of the clamp.

All parts subject to wear are of the Best Cast Steel, and all made to gauge and interchangeable.

This is the Lightest and Strongest Rock Drill yet invented. Being nearly all Cast Steel, it is easily handled and moved, as all superfluous metal is dispensed with.

We also call the attention of those interested to the Horizontal Air Compressor furnished with the Buckminster Drill when desired. It is Economical, Light, Easily Run and conveniently portable.

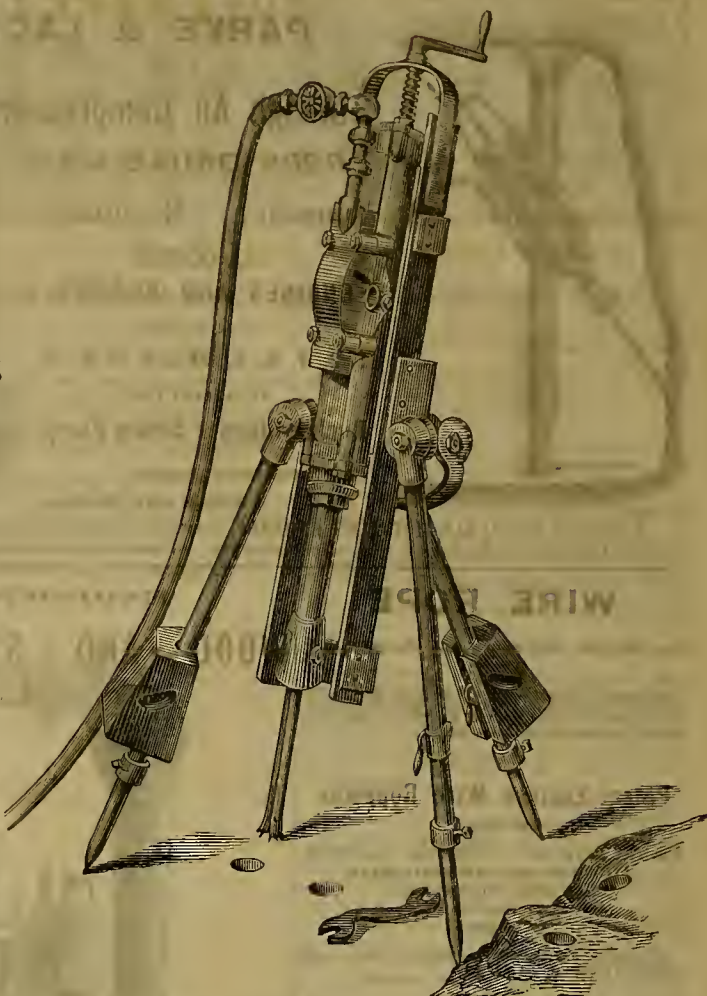
We claim that the Buckminster Drill will do as good work as any in the market, at a much less expenditure of power, and a great decrease in first cost of machinery. Drills made all the usual sizes.

Mining Companies Desiring Rock Drilling Machinery should Examine this Drill and Air Compressor, and we are confident that it will give satisfaction. Address,

PACIFIC IRON WORKS,

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MANUFACTURERS OF ALL CLASSES OF MACHINERY.



BEFORE PAINTING YOUR HOUSES

Send for Sample Card and Circular and Carefully Examine the

AVERILL CHEMICAL PAINT,

MIXED READY FOR USE.

This Paint is prepared in liquid form, READY FOR THE BRUSH. It requires no addition of oil or spirits. It is composed of the best materials known to the trade—Pure Linseed Oil, Strictly Pure White Lead, Pure Zinc, and the finest of coloring matter for tinting. It is the BEST, CHEAPEST, MOST DURABLE AND BEAUTIFUL PAINT IN THE WORLD. Is just what is wanted by every farmer, mechanic and everybody who has a house, fence, barn, or wagon to paint. Requires no skilled labor, as any one can apply it who can handle a brush. It is put up in cans of any required size, from a quart to five gallons, and is sold BY THE GALLON. It gives a firm, elastic and brilliant glossy finish, and will neither crack, peel or wash off, like most paint in common use, but is proof against rainstorms and all action of the elements. Buildings painted with this paint five years ago look fresh and like new to-day and will need no more paint for years. Of no other paint can this be said and proved.



The Averill Chemical Paint Company supply a long-felt want. They not only furnish a Paint more lasting, handsomer, and at the same time cheaper than the best of others, but it is in a liquid form—white and all the fashionable and most exquisite shades—ready for the brush. So that farmers, in fact everybody, can be their own painter if necessary. Indeed, all the buildings upon which the Averill Chemical Paint has been applied, are marvels of beauty.—*Christian Union*.

We know of no subject of such importance to householders as that of a good, handsome, durable paint for their dwellings. Within the past few years we have watched the progress of the Averill Chemical Paint and have had frequent opportunities to test it fully. We think it just the article to supply the need, and give it our hearty endorsement.—*N. Y. Independent*.

From the Thousands of Testimonials sent us, we select the following, which we present for your careful consideration:

A PAINT FOR FARMERS.—Prof. J. B. Turner, Jacksonville, Ill., is a man of great practical knowledge and experience; hence, we attach a great deal of value to the following, from his pen, which we find in the *Prairie Farmer*.

"Some two years ago I sent for and got from a barrel to a harral and a half of Averill Chemical Paint, of light dun color, which I thought would suit me well enough for all work—houses, doors, blinds, fences, bee-hives, wagons, tons and all. I put two coats upon my residence here, and run over three or four of my smaller farm houses on my farms. With what was left I painted my bee-hives, wagons, wheelbarrows, rollers, harrows, fences, etc., etc., and on all these buildings, implements, tools, gates, etc., the paint is as hard and glossy to-day, as far as I can see, as it was a month after it was put on, and bids fair to hold its own at least for five years to come, (if not ten of them,) better than ordinary white lead and oil does for even two years.

"I have watched it now for about two years with interest and care, and have never found a single spot where it peeled, cracked, or chalked off, as our other paints do. Others who have used this paint like it equally as well. But the point is, I can take one and the same keg and brush, and go over all my buildings, wagons and tools, with no needless waste of paint, brushes or time. It is quite as good for inside finish, as it leaves a coat that shines and washes like glass."—*Moore's Rural New Yorker*.

THE AVERILL PAINTS.—In reply to some inquiries of our readers, we would state that we have given these paints, prepared by the Averill Chemical Paint Company, a full trial, and they appear to possess all that is claimed for them: spreading easily, adhering well, drying soon, and imparting handsome shades of color to the surface covered. Farmers and others who do their own painting, may avail themselves of the convenience of purchasing these paints, of any desired shade, already mixed for use, at a very reasonable price.—*Cultivator and Country Gentleman*.

TO THE CALIFORNIA CHEMICAL PAINT CO: Gentlemen—In reply to your letter I have to state that for more than six years I have dealt in and used your paint. I have during that time carefully observed its application and use, and from practical knowledge can certify to its unrivalled excellence. During my six years' acquaintance with it, there has not come in my knowledge a single instance of failure in any case where it has been used. All to whom I have supplied it unite in commending it for its superior claims over all other paints now in use. The Averill Paint externally used, or, in other words, exposed to the action of the weather, neither rubs off nor changes color, as do other paints, and will retain its freshness and adhesive property for years. Pure lead and oil will in a short time become dry, and are easily rubbed off, the loss of oil leaves the lead in a dry, oxidized state. As a matter of economy the claims of the Averill Chemical Paint to popular appreciation and general use are beyond question. A house properly painted with it once will be better preserved, and present a neater appearance at the expiration of seven years, than it would if twice coated with lead and oil paints now in use. There can be no question, then, that to use it is both labor-saving and economical. So well assured and convinced am I of its established right to this distinction over all kinds, that had I fifty houses of my own to be painted, the "Averill" alone should be my choice and used.

Yours, very truly,

S. J. ALDEN, Druggist.

UNIVERSITY OF CALIFORNIA, BERKELEY, August 16, 1875.

TO THE CALIFORNIA CHEMICAL PAINT CO. Gentlemen—In reply to your note of the 13th inst., I willingly state that the work done by you in painting the exterior of the North Hall or College of Letters is in every way satisfactory, and the appearance of the building since it was painted excites the favorable comment of all who have seen it. As I have had occasion to use the Averill Paint before, my experience has been such that I prefer it to any and all others when properly applied. I am very truly yours,

ROBT. E. C. STEARNS.

Sample Card of Colors Sent Free on Application.

Be Sure and Write for One and Examine for Yourself before Buying Any Other.

CALIFORNIA CHEMICAL PAINT CO.,

117 PINE STREET, SAN FRANCISCO.

MINING MACHINERY DEPOT,

PARKE & LACY, 417 Market Street, S. F.

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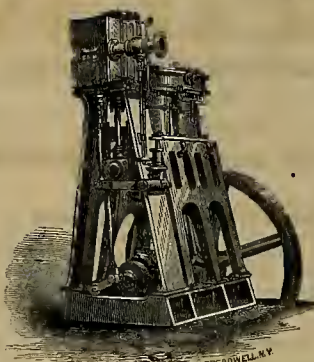
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Bucket-Plunger Steam Pump.

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Centrifugal Steam Pumps.

FARMER'S ELECTRIC MACHINE
FOR BLASTING AND HILL'S
EXPLODERS.

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For Mines.

Large Assortment of

MORSE TWIST DRILLS.



HASKINS' PORTABLE HOISTING ENGINES, constructed especially for economical use in mining districts, with Compressed Air or Steam, adapted to all classes of underground work and made throughout on the interchangeable plan, so that all parts can be duplicated when desired. Catalogues and Estimates given on application.

WIRE ROPE

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All kinds and sizes on hand, or made to order; guaranteed of unsurpassed quality, and manufactured of any length. FLAT ROPES, ROUND ROPES and TAPER ROPES, of IRON OR STEEL.

Patent Endless Wire Ropeway

(WIRE TRAMWAY)

FOR THE RAPID AND ECONOMICAL TRANSPORTATION OF ORES AND OTHER MATERIAL OVER MOUNTAINOUS AND DIFFICULT ROADS.

This system has been in use for over three years and given thorough satisfaction.

PATENT GRIP PULLEY.

For transmission of power by means of wire ropes

WIRE.

Fencing Wire and Staples,

BALING WIRE,

SPRING WIRE,

GALVANIZED WIRE,

BROOM WIRE,

STEEL WIRE,

COPPER WIRE,

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And Wire of all kinds, on hand or made to order.

SOLE AGENT FOR

Richard Johnson and Nephews' Celebrated Telegraph Wire.

Full stock on hand in bond, or duty paid.

Wire Cloth and Wire Netting,

Full Assortment on hand for all Purposes.

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All Kinds of Goods in the Wire Line.

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A. S. HALLIDIE,

113 and 115 Pine Street, S. F.

Amusements.

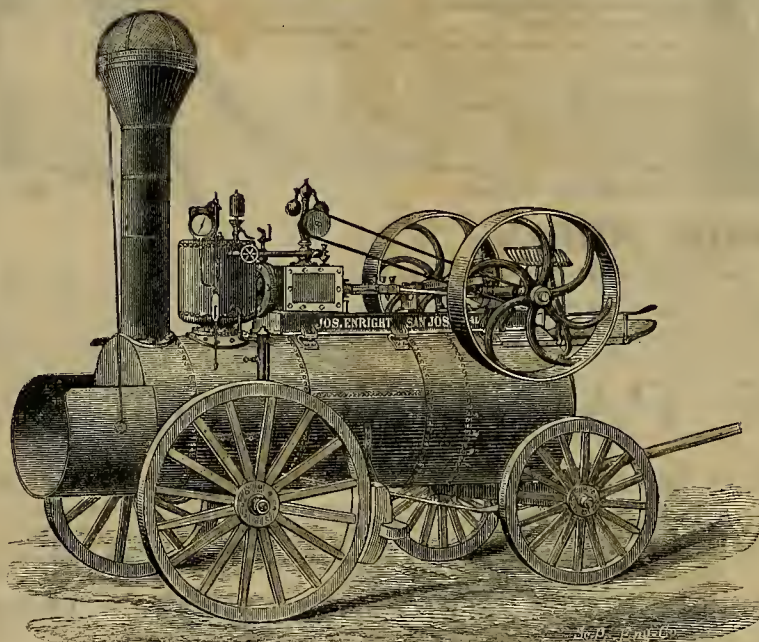
WADE'S OPERA HOUSE, Mission Street, near Third. Open every evening with first-class Dramatic Company. Box Office open from 9 A. M. to 10 P. M. Doors open at half past seven. Commence at eight o'clock. GEO. RIGNOLD in "HENRY THE FIFTH."

CALIFORNIA THEATER, Bush Street, above Kearny. Open every evening with the best Dramatic Company in the United States. Box office open from 9 A. M. to 10 P. M. Seats may be secured six days in advance. Doors open at half past seven. MR. CHARLES FECHTER.

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Patented July 20th and November 2d, 1875.

Burns Wood or Straw without change, and Coal by changing two plates. Took the Premium at the California State Fair, 1875, as the Best Straw Burner.

PIONEER BUILDER OF THE FIRST PORTABLE THRESHER ENGINE ON THE PACIFIC COAST, 1861
PATENTEE AND BUILDER OF THE

BEST PORTABLE STRAW OR WOOD BURNING THRESHER ENGINES, 1876.
Send for Testimonials and Price to

JOSEPH ENRIGHT, San Jose, Cal.

Ms. J. ENRIGHT—Dear Sir: The Straw Burning Engine I bought of you, and which was used in Yolo county, has given me perfect satisfaction. It is everything you represented. We have had no difficulty in generating all the steam required, and the amount of straw consumed can hardly be misused. We find it much safer, on account of fire, than a wood burner. Many persons, both threshers and farmers, have come to see it run, and all express themselves highly pleased. The opinion of all was, that it is just what we need, being safe and economical.
H. M. LARUE.

Umpire Tunnel and Mining Company of Utah.

At a Directors' meeting of above company, held on the 16th inst., it was resolved that a meeting of stockholders of the company be convened on Monday, June 19th, 1876, at the office of the company, 535 California street, to decide upon a proposition to increase the capital stock of the company from three hundred thousand (\$300,000) dollars, divided into thirty thousand (30,000) shares of ten (10) dollars each, to seven hundred and fifty thousand (\$750,000) dollars, divided into seventy-five thousand (75,000) shares of ten (10) dollars each.
(Signed)

S. R. HARRIS.
W. W. DAVIS.
T. E. HUGHES.
E. McPHERTRIDGE.
WM. SMALL.

San Francisco, May 25th, 1876.

ANGELL'S CHARCOAL DENTAL SOAP
for Whitening and Preserving the Teeth. J. W. ANGELL, Prop., San Francisco.

MINERS write for your paper.

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Pioneer Screen Works,
Removed to 32 Fremont Street, near Market.

J. W. QUICK.
Manufacturer of perforated sheet metals of every description, at reduced rates. Mill owners using Battery Screens extensively, can contract for large supplies at favorable rates. This is the only establishment on the Coast devoted exclusively to the manufacture of "Screens."



Nearly One Thousand in Use
BUFFALO PONY PLANER. Will earn itself and pay expenses of running in 8 days. Price from \$50 upwards, each. Also, small Pony Planers and Matchers, and Planing Machine Knives. Recommended as superior and extra in quality. Circulars free. One hundred Scotch designs free on receipt of stamp. Address
GEO. PARR, Buffalo, N. Y.
DUNHAM, CARRIGAN & Co., San Francisco, are Sole Agents in California for my Heavy Wood Working Machinery.

W. T. GARRATT'S

BRASS and BELL FOUNDRY
SAN FRANCISCO,

MANUFACTURER AND IMPORTER OF
Church and Steamboat BELLS and GONGS,
BRASS CASTINGS of all kinds,
WATER GATES, GAS GATES,
FIRE HYDRANTS,
DOCK HYDRANTS,
GARDEN HYDRANTS.

A General Assortment of Engineers' Finding.
Hooker's Patent Celebrated

STEAM PUMP
The Best and Most Durable in use. Also, a variety of other

PUMPS
For Mining and Farming Purposes.

ROOTS' BLAST BLOWERS,
For Ventilating Mines and for Smelting Works.

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For Mining Purposes.

Garratt's Improved Journal Metal.

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ALL KINDS OF
WORK AND COMPOSITION NAILS,
16-17 AT LOWEST RATES.

N. W. SPAULDING'S



PATENT DETACHABLE TOOTH SAWS.
Manufactory, 17 & 19 Fremont St., S. F.

IRON PIPE.

Having been appointed Agents for the Washington Pipe Works, we are prepared to ship from store, Pipe and Fittings at the lowest market prices.

BERRY & PLACE, San Francisco.
TREADWELL'S OLD STAND.

Assaying Taught. Practical Instructions on General Analysis.
J. Phillips & Co.
EXAMINER OF MINES, MINERAL ASSAYER & C.
640 CLAY ST. S. F.

Author of
Explorers', Miners', & Metallurgists' Companion,
672 pages, 63 Illustrations. Price 2d edition, \$10.50.
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Dewey & Co. { 224 } Patent Agt's.
{ Sanson St }

MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO.,
Patent Solicitors.

SAN FRANCISCO, SATURDAY, JUNE 3, 1876.

VOLUME XXXII
Number 23.

Some of the Mines of El Dorado County.

[By Our Own Correspondent.]

Before reaching Placerville I had almost come to the conclusion that the people of that county had lost all interest in their mines, more particularly their quartz claims. In this I was mistaken. Work has already commenced on some lodes that had not been worked for some time, and there seems now to be a disposition to commence operations within the next two months on many an idle claim. In fact, the Fryer process and other new methods of reducing ores are reviving hope in the breasts of many from the promise of success which they give, and soon I hope you will hear of a general awakening in this heuhtened land on the subject of mining.

Some rich discoveries have been made here within the past two years in what is called "porphyry claims." I have made a cursory examination of three or four of them. The lode is chiefly of porphyry, and has well defined east and west walls.

Quartz, however, is evidently the matrix of the gold, and it is probable that by sinking to considerable depth on them the quartz seams, which are from one to six inches in width, would be found much larger, developing, in some cases, into a regular quartz lode; for as to those examined, the porphyry within the walls appears to be a metamorphosed slate, and it is likely the change in the rock has taken place about the time the gold was deposited, and produced by similar causes. No two have precisely the same characteristics. For example, in Mr. Shaw's claim, near El Dorado, a small seam of quartz, mostly decomposed, is found on the east and west walls 3 to 4 in. wide, and wherever there is an elbow the chimney of rich ore appears—the hanging wall carrying the largest deposits. A pocket not larger than an upright churn has yielded from \$3,000 to \$8,000. Mr. Shaw told me that two or three men had taken out here \$33,000 the past two years. They often work for months without finding anything.

In Mr. Brown's claim the quartz vein is sometimes six inches in width, and runs in the midst of the porphyry instead of along the walls. The lode, 100 feet wide, is bounded on one side by slate, and on the other by granite, the gold being more evenly distributed, and not found in from two to five pound lumps, as in the former case, the largest being about \$200. Thus far his labor has been handsomely rewarded. The figures are withheld from the public by his request. In this connection it might be well to state that many in this county, as in other places, are quietly working away at their claims and are doing well, but prefer not to have their private affairs paraded before the public.

In the same neighborhood is a very promising quartz vein, opened to the depth of about 20 feet, running northeasterly, near the junction of the slate and granite, belonging to the Messrs. Miller—known as the Miller claim. Lode from two to three feet wide, assays have run as high as \$1,000—learned that it had worked by mill process about \$15 per ton. From what I could learn it is not a pocket lode; the gold in seams is fine and somewhat evenly distributed. Mr. N. S. Miller, one of the partners in the mine, is now prospecting or working, not far distant from this, another quartz lead, which was not visited. Mr. M. will pardon me for stating what his neighbors all around seemed to know, that he was one of the lucky ones that recently struck a rich pocket in a porphyry claim, that made him in a few hours a richer man by several thousand dollars (they say \$7,000 or \$8,000). The rock was pounded in this case as in all similar workings, in a common hand mortar.

The Davidson mill and quartz mine in the same neighborhood are expected to start up some time this season. The mill has 20 stamps and the shaft is down 300 feet. The

Church Union

Gold mine, two and one half miles northeast

of El Dorado, consists of two lodes, the Union and Cosmunes, shaft 275 feet on each. The books of this company show that \$1,000,000 has been taken from the Union lode since 1851. The ore pays \$35 to \$40 per ton. The mill is now running on Cosmunes ore. Last crushing \$18 per ton, 10-stamp mill, capacity 15 tons per 24 hours. Run by water, hydraulic pressure, hurdy-gurdy wheel, 400 feet pressure,

in the county. The company are pushing the work rapidly, working at present with an arrastra, and are intending, at no distant day, to put up a mill.

The St. Louis Gold Quartz Company, Six miles east of Placerville, lays claim to having the finest hoisting works in the county. Their incline—three compartments—is down 220 feet, and thoroughly timbered. Width of

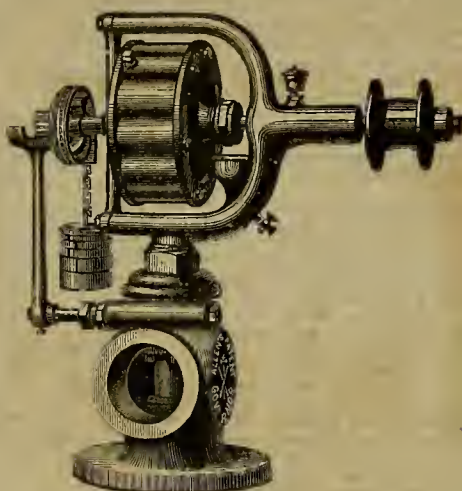


FIG. 1. GOVERNOR AND VALVE.

20 inches of water, weight of stamps 650 pounds, 18 men employed. Indebted to Mr. D. C. Wickham, superintendent, for facts.

The Schneider claim, one and a half miles south of Diamond Springs, embraces two lodes, averaging each three feet; rock works from \$20 to \$30 per ton by arrastra. The quartz has a lively appearance, with gold to be seen in many specimens. At work; about 150 tons of

lode, four feet; the character of the rock is considered very good, a high grade ore, assaying well. It is said that gold is found in paying quantities, even in the porphyry. There is a considerable quantity of ore on the dump, but no mill has been put up, from the fact that the superintendent, an old quartz miner (and by the way, an acquaintance of former times in Virginia City), thought it advisable to first



FIG. 2. SECTION OF GOVERNOR.

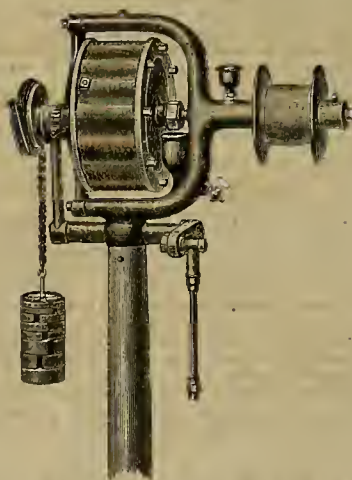


FIG. 3. FOR VARIABLE CUT-OFF ENGINE.

ore on dump. Tunnel 300 feet in length; depth of shaft, 50 feet. Can be tapped by tunnel to the depth of 400 feet. Located on Martheus creek; has free water six months in the year, and can get 300 to 400 feet pressure by purchasing water. The greatest depth reached 140 feet—tapped by tunnel.

The Veach Quartz Mining Company

Is situated near old Baltic mill, 21 miles east of Placerville, on Camp creek, or north fork of Cosmunes river. The discovery was made July last. The lode is about two feet in width; tunnel 30 feet and shaft 40 feet. Mr. Veach, the locator, informs me that the ore will average \$30 per ton, gold very fine and interspersed evenly through the quartz, and expressed the belief that it bids fair to prove one of the best

prospect the mine thoroughly. In this he was wise, for many a mill has been built before it was required. My modest friend believes that depth only is required to place this mine on a solid paying basis. It is owned chiefly by parties in St. Louis, Mo., as its name indicates. Placerville, May 24th. K.

DEVELOP THE MINES.—This matter is brought before the readers of the *Placer Herald* in the following brief and pointed manner: "The importance of developing our mining interests cannot be overestimated. Activity among miners promotes business, and business leads to wealth; inactivity promotes dullness, and dullness begets hard times."

The Allen Governor.

During the last fifty years it has been the constant effort of thoughtful engineers and machinists in all the world to discover the best mode of maintaining a uniform speed in the working of steam engines while variations occur in the amount of work done by them. It is well known that machinery cannot produce its most profitable results without being run at the highest rate of speed consistent with its durability and the production of a perfect fabric, and that no machinery can be run at or near its highest rate when subjected to uncontrolled variations. The object sought for in the peculiar construction of the Allen governor, illustrated on this page, is the thorough and accurate regulation of steam engines, and especially those with adjustable cut-off.

The peculiar construction of this governor will be clearly understood from the following: "Within a corrugated cylinder, which has small projecting ribs on its interior periphery, and which is partially filled with oil, a paddle-wheel is caused to revolve by a spindle passing through one end of the cylinder, driven by a belt communicating with the fly-wheel shaft. The tendency of the revolving paddle-wheel is to cause the cylinder to move in the same direction. On the opposite side of the revolving spindle is a trunnion or short spindle fixed to the cylinder, attached to which is a wheel carrying a set of movable weights suspended by a chain, the speed of the engine being regulated by the number of weights. Attached to the wheel and keyed on the end of the short spindle is a pinion revolving with the cylinder, and working in a toothed sector, the arm of which, being fixed on the spindle of the throttle valve, opens or closes it as the oil cylinder moves with the paddle, according to the variation of load thrown on the engine. When used with variable cut-off engine, the arm is attached direct to the cut-off."

From the above brief description of the Allen governor, it will be readily understood that its principles are in accordance with natural laws. It will be seen that the weights are raised and lowered in a nearly vertical line, and, unlike those of other governors, remain the same at every point of their suspension. The high rate of speed used acts advantageously in making the governor very sensitive; and, all parts being lubricated, it works with the smallest amount of friction. The centrifugal or ball principle being entirely abandoned, the movable weights are suspended as easily at one point as another, by the action of the paddle-wheel in the oil cylinder; and from this fact, together with other peculiarities of its construction, gives a direct saving of fuel, and a considerable increase in the power of the engine.

The peculiar action of this governor, which allows the use of a valve of large area, thereby admitting to the engine cylinder the greatest possible boiler pressure at each stroke of the piston, has produced astonishing results by being attached to old engines, greatly increasing their power, or effecting a direct saving in fuel, and in hundreds of instances doing both. In running an engine with this governor, with high or low pressure of steam and with all variations of power, the throttle is opened wide in the morning and remains so until closed at night, thus relieving the engineer from all labor and care except keeping the engine oiled, and giving him a great deal of time for other duties.

Allen's patent governor valve is constructed with a double disc in a tubular form, and is perfectly balanced, there being no spindle, as in the ordinary throttle-valve, to interfere with its equilibrium. The valve is moved by means of a lever, and is opened and closed by a rocking motion of a steel spindle, which is covered with brass, ensuring the greatest possible durability. A large number of highly commendatory reports upon the working of this governor are submitted. It has just been introduced on this coast by the Pacific Iron works, First and Fremont streets, San Francisco.

COAL BEDS.—J. Ferris informs us that extensive coal beds have lately been discovered from the head of the Sevier river through the Panguitch country. The coal discovered is of good class.—*Pioche Record*.

CORRESPONDENCE.

Botanical Excursions.

[By J. G. LEMMON.]

No. 2. The Northern Valleys and Lassen's Peak. (Concluded.) Part IV. Big Meadows and Lassen's Peak.

Escaping in about a week from the friendly people of Indian valley, not, however, without a second call at Dr. Hnut's, young Larsen and I hastened westward along the north shore of the valley, amidst its enchanting groves and dells. At Aheem's ravine we turned off to visit a high valley and the Greenville peaks, a very satisfactory side trip of two days, in which we collected a woolly variety or new species of the beautiful *eycladema*, and a new *Lupinus onustus*. Next day we reached Greenville, a busy mining town, whose locality can be noted from far by the thunder of its quartz batteries and shriek of its engine whistles.

Here a party of four had arranged to join us, but failed to appear. As the weather was fearfully hot, perhaps they profited by the failure.

Alone we climbed the mountain road northward. We felt not the slightest loneliness as we toiled up the flowery way to the pass, 12 miles; besides, we imagined the Rural readers with us, and thought of the rapture that would soon thrill them at the first view, and the interest that would fill their souls for days while exploring in detail the crowding wonders ahead.

Lassen's Peak.

As at Pyramid lake the eye was first riveted to the strange pyramids, so here you first gaze with awe upon the pyramidal mass of snow, rent with comba of black lava, that is reared against the sky in the far distance.

Not alone towers the majestic peak. On all sides it is embellished by scores of glittering pinnacles rising from an alpine region many miles in extent, all apparently covered with snow. It was a refreshing sight that blazing July day.

This grand old landmark is named for Pete Lassen, the old pioneer, and was visited and first described scientifically by Brewer and King in 1863. Next to Mt. Shasta and the lofty group around Yosemite, this is the most noted peak in the Sierra. This result not only from its great elevation—nearly 11,000 feet—but also from its conspicuous position, being in full view of the great valley of the Sacramento on the west, and the great basin of Utah on the east.

This has been availed of by the authorities, who have established Lassen's peak as the corner of three counties—Plumas, Tehama and Shasta.

Big Meadow Valley.

Down before us lies the great, shield-shaped valley, its floor a green and yellow sheet of ripening grass. Like ornamental vines in bas-relief on the shield, are the waving lines of willows that mark the river courses. Round clumps of trees at their sources show the locality of the great springs, of which we have heard so much, while flocks of pelicans, wheeling lazily in the air over the valley, tell where the extensive lagoons are found, green with hundreds of acres of pond lilies.

Land's Big Spring.

Turning to the right, we first visit the great spring near Land's old station. You hear the rush of water an eighth of a mile away. Pressing through the rank grass and over-hanging alders, you walk out on a fallen tree, and a startling yet lovely scene is before you.

A river bursts from out the white quartz rock of the mountain side and cascades down into this deep basin beneath. A line of immense fountains, extending from the cascade through the length of the pear-shaped basin, boil up from the bottom. Circles of waves show the locality and force of these fountains, which even the rush of the mountain torrent cannot obliterate. The outlet of this one congeries of epriaga is 15 to 20 yards wide, and is deep enough to float an ocean steamer. Has the earth anywhere its equal?

This is a type of the springs of this valley, and it is no wonder that visitors from far and near to the valley every summer to gaze upon these stupendous phenomena and to revel in their cool groves. The water is the clearest and coldest you ever drank, resembling the crystal, mountain-distilled Tahoe. It flashes everywhere with silver trout, apparently but a few feet down, but your fishing rod needs 20 or 30 feet of line, so deceptive is the pellucid flood. Paddling out in an Indian canoe you seem floating in air, and frequently put down your hand to determine where the two elements touch.

Peering over the side you see plainly the white toiling eand of the fountain, nearly covered with black globes constantly rolling about. Fishing one up from its home 20 feet below, you find it the globular noston, a ball of rubber filled with jelly. They are all sizes, from bird-shot up to a schoolboy's ball. This is a species of fresh water algae, plants of the lowest order, a simple cell. In the river below are several other species; one a leathery, convoluted mass of gelatinous substance that fills a wash-bowl.

Down where the basin narrows to the outlet,

a pair of white pelicans float, and beives of mallard and divers are in pursuit of young trout. Among the luxuriant flora fostered by this spring, I found on my first trip with Prof. Case the beautiful *Corydalis Caseana*, and several other rare plants.

Reinforcements—The Marlin Brothers.

Crossing fields, meadows and stock-ranges to the farther side of the valley, we are arrested and "corralled," as they say in the mountains, by Mr. Olsen and family, wealthy farmers, similar in disposition to the people of Indian valley.

While drying papers and re-organizing here for the further trip, the neighbors dropped in at night and two brothers, Oscar and Aurelius Martin, arranged to join us, with a full equipment of supplies and the adequate courage, for the exploration of Lassen.

Driving along the dim road up the mountain slopes, with these gallant brothers alongside, our quartette made a very agreeable party, not so small as to lack enthusiasm nor so large as to divide into schisms. These brothers were a study, and by contrast. Oscar, the oldest, was stalwart, round-faced, jovial, daring, appreciative, intensely enjoying natural scenery off-hand. The other, Anrelius, slender, oval-faced, sedate, cautious, quietly appreciative, closely studying with a mind trained by long acquaintance with books and teacher. Oscar carried a heavy rifle to reach for deer or bear, Aurelius a telescope; Oscar brought in rare plants from bog and rock, Anrelius classified them; Oscar admired their appearance and gave the virtues ascribed to them by the Indians, Aurelius demanded their botanical names—carrying a note-book for the purpose.

Around subsequent camp-fires, after the usual scientific discussion, which both enjoyed, Oscar made the welkin ring with song and humorous story, Anrelius recited masterpieces of the old classics, or read original essays.

Hol Lake.

Arrived at Hot Spring valley, all proceeded on foot over a ridge a half mile to see a wonder.

Shrouded in a dense wood is an oval basin 600 feet long by half as wide, filled with nearly milk-white, thickened water, kept boiling hot by fire vents nearly encircling it and apparently the cause also of the incessant bubbling beneath. A narrow, flat rim of white sedimentary matter separates the boiling water from the steaming bluff—the wall of the basin. This border is pitted with msh-pots, blow-holes and miniature volcanoes, from which issue, intermittently, steam, water and mud, roaring, spouting and spluttering, like an immense caldron of garbage. To complete the horrid scene and fix it in your memory, sulphurous gases roar out from holes in the bank and nearly suffocate you. Young Larsen, who had navigated the Mediterranean, exclaimed "How like the *solfataras* of Veenvius!"

Hot Springs.

Two miles farther and the hot springs are heard, a half-mile ahead. This group of noisy rents and vomiting craters is situated in a ravine down which comes a small stream, cold as ice, till it falls into these repelling fire-holes, seemingly a volcanic fissure. For two or more acres on each side the mountain has been fretted away, leaving only the hardest rocks, colored and spangled with iridescent crystals. Great hoppers are frequent, in which rocks are slowly sliding down to be dissolved by the fervent heat below, and carried away in both liquid and gaseous form.

Thoughtfully we stepped from rock to rock around the roaring vents and funnels. The question presses, "Whence this terrible ebullition—this fervent heat? Comes it through a fracture in the crust of a molten globe, or is it evolved chemically by the meeting of antagonistic elements but a few feet below the surface of a solid earth?"

Corydalis Caseana.

Leaving the wagon now and all taking to horse, we wind up through the forest of *Picea amabilis*, or red silver fir, eight miles, and Caseana valley is reached. This is a meadow or swamp of rank herbs and grasses skirted with alders and cut through with streams the banks of which are lined with the new *Corydalis Caseana*, which I have omitted to describe until we came to its home. Here the plant grows to the largest size and presents the finest appearance of any locality yet found. It is often found four to five feet high, and its fragrance is detected 10 rods away. The abundant foliage is pea green, and the robust branches terminate in spikes of white flowers holding a purple swollen palatte in the open mouth, and provided with a large spur or sac of nectar below. The succeeding pods contain four to six black, ariled, hard seeds, that when ripe are thrown to a great distance by the valves of the pods. The slightest breath or touch, and woe to the curious eyes unprotected. With difficulty I have captured a few seeds, as you would catch grasshoppers, and sent them abroad. Thriving plants are now reported in Cambridge, Philadelphia and Washington, also in England and the continent.

King's Valley and Camp.

A prolonged ride over my streams, up steep caving bluffs, along the base of a mountain of rock beautifully chiseled into columns, arches, towers, forts and cathedrals, and through another deep forest tangled with fallen logs, prickly monkeytree and ceanothus, and the near Lassen looms grandly to view through a gap with a green little valley just at our feet. This valley is generally filled with snow until

August, but was now green, owing to the light winter past. It was the rendezvous of Brewer and King and shall be ours.

Choosing a grove of silver spruce, *Abies Pattoniana*, we made beds of fir boughs, lighted a camp fire and sat down to as fine a supper, prepared by Larsen and Oscar, as a king enjoys. How many pleasant evenings that grove witnessed during the week following! Animated discussion, joke, story, song, recitation, crowded the hours until the fatigues of the day overpowered the most hilarious and Morpheus ruled the camp.

Ascending Lassen.

We resolved to see the sun rise from the summit of Lassen and groped three hours through the bushes and up the steep four miles to be enabled to do so, but daylight caught us just at the base of the bald striped cone, which, as we gazed up at it, seemed interminable in its vaulting reach into the cerulean ether. We hoped to look down upon the sun from a perch of 10,000 feet and see him come out from the morning clouds red-faced and battered; but no, the air was clear, and old Sol bounded out of the Humboldt mountains as bright and round as at midday.

Larsen and Oscar proposed to climb directly up the south face. Aurelius and myself passed around to the west of his periphery and took the advantage of a longer grade. A comb of lava jutted out of the west side, extending with but few missing teeth from base to summit. In the gorge to the east of this lies a wedge of perpetual snow, its broad base downward and resting on a plateau of the same. Between this snow wedge and the comb of lava is a space of a few rods of lava dissolved to ashes by the alternate snows and suns of ages. Up this prepared trail we climb. Near the snow the water-soaked ashes admit the climber to the knees, the sharp teeth of lava utterly forbid progress over them.

Happy were we if we found the golden mean. Having a botanical press along, we gathered the flowers by the way, *Eriogonum*, *Penstemon*, *Hulsea*, *Draba*, *Gilia*—families so modified by the Alpine situation as to be hardly recognized. We had left tre and shrub far behind on the plateau below, and fast appearing peaks rose over the forest on every side. Planting our feet carefully in the abutting rocks, we took hold of the comb teeth and pulled our weary frames up from hummock to sag, and from rock to rock. As we were compelled to halt at intervals to breathe and take a swallow of water, the eye roamed over a wide landscape picture that brought brief exclamations, but the light air and great fatigue forbade conversation. We had resolved at the start to keep on the south side of the comb, so as not to catch sight of the peerless Shasta until his head should tower over Lassen's crown, so for hours we kept doggedly toiling up the south face; but about half way up a few rods of teeth are broken away, admitting a full, glorious view of Shasta—not to be described in this place.

The mounting snow now emote our fevered heads, and we gladly took refuge on the north side of the comb, as we pulled up in its shadow. Peaks glistened, and half-broken craters yawned on the west, but we must leave off looking and give all attention of eye, limb and mind to the business of climbing. Slowly we ascended. Often on hands and knees was a dizzy rock ridge passed. Another swallow of water, and a long, terrible struggle amidst sliding blocks of lava, and a high crag is reached, in the shade of which we drop exhausted. But beyond we see the soft, pinnacles alone brow of Lassen envying over, promising better climbing. We shout to cheer each other only one word "Conrage!" and strike heels into the ashes again. Up the soft pinnice in the vertical night, over the sliding shales in the motionless air, and another rock saves the fainting pilgrims! A change of footing—a welcome change! Here the wedge of snow ascending the entire south face of Lassen is found to be connected by a broad band—nansen from below—to a similar wedge-shaped mesa descending on the north side into a vast crater.

It was down this steep of snow on the south side—this precipice of deep pot-holes four to 20 feet across—that Prof. Case and I bounced, three years before, to the base of Lassen, nearly three-fourths of a mile in less than half a minute! Shuddering, I carefully keep away from the brink now.

Across and above this isthmus of blinding snow, 300 feet higher and a fourth of a mile farther, frowns the splintered topmost spur, with a tiny acorn-like monument enmounting it—the goal of our efforts. The interrupted lava comb grew bolder now, straggling and precipitous, but over it only is farther progress. In our haste we miss the best routes, and often have to retrace steps.

Arriving now at the base of the crowning spur, we find it shattered and channeled into labyrinthine chambers that often lead to the sheer precipice on either side. Retracing and trying other passages we emerge at length into daylight, with lichen-covered rocks on edge paying the narrow way before us. A hailing voice is heard, and raising our eyes, there, composedly sitting on the monument, are our daring comrades of the early morning, a full half-hour before us in a direct ascent up the yielding ashes of Lassen's steepest side,—a signal triumph of pluck and muscle seldom recorded!

On the Airy Summit.

It would take a master pen and many long paragraphs to picture the grand scene presented from the monument of Lassen that clear July day. I can only sketch its salient features.

The view embraced 350 or 400 miles north and south, from Mt. Pitt and the snowy Cascade leading the eye a hundred miles over the Oregon line, to the lofty peaks around Tahoe in the middle Sierra. The gridiron bars of the great basin lay revealed on the east, and on the west perhaps 300 miles of the Coast range, from its extreme northern buttes to Mount Hamilton near San Jose. The Sacramento valley lay like a map unrolled, only that it bore in relief the buttes, groves, towns and bridges, and was graven with ravines, rivers and roads.

But the eye is withdrawn from these distant objects in spite of the will, and fixed upon two nearer ones; the one a single peak so lofty, so white, so pure, that all the answering attributes of your soul stir within you at the sight; the other a row of peaks whose composition and contour fill your mind with imaginings most dire, and your spirit shrieks aghast!

The first, the pearly white spire piercing the skies, is the Red man's "snowy throne of Yopitons."

Mount Shasta.

Shasta is the crowning peak of the Sierra, the cynosure of all eyes in the Sacramento valley.

It is 14,442 feet high and in such latitude that the upper 3,000 feet of its spire is almost perpetually covered with snow. It is 70 miles north-west from Lassen, but, seen from the latter, the observed and the observer both being above the humid atmosphere, it seemed not half so far, so distinctly does spur and ravine, crag and cave, appear to the unaided eye. On my first visit to Lassen, three years before, Shasta presented a greatly changed appearance that was truly appalling.

Dust and smoke enveloping the whole country to the height of 8,000 feet, completely obscured the base of Shasta, leaving the great white mass apparently floating on the rolling dun. Where was the iceberg sailing? Might it not come crashing along this way, or worse, topple over and crush our little snowbank to atoms? But to-day it touches bottom, and is fixed to a broad base. To-day its relation to the Sierra is seen, as its grand, culminating head, high-reared and turned westward sufficient to keep watch and ward over the Sacramento valley.

The other object chaining the mind and freezing the blood, is nearer still.

A Phalanx of Volcanoes.

Lassen is the highest remaining spur of a once continuous range of colossal volcanoes crossing the Sierra from east to west. Two of them on the east, nearly in line, may be seen with perfect clarity, round as a caldron, sunk in their tops. Directly opposite is a tall, shining shaft, nearly as high as Lassen, and beyond it similar peaks, all presenting one preëminent side, stratified and colored by volcanic fires. This is perfectly evident from Lassen's standpoint, but several days of subsequent exploration proved them to be a range of a dozen pinnacles, extending 20 miles, each the remaining spur at the side of a vast crater.

Some preëxposed opposing sides so marked as to prove companionship and indicate a crater between them many miles across.

Lassen's Crater.

And here, right at our feet, yawns an immense crater, 800 feet deep and half a mile across. At four points on the rim are left spurs of trachyte lava facing inward, upon the highest of which we are standing, 10,577 feet above ocean level, now; but where were ocean, bay, plain and mountain range in that age when this crater, in company with its phalanx of brothers, with earthquake energies vomited lava and granite boulders from the globe's molten center, and poured them over the surface, perhaps converting an ocean into steam or a primeval forest into ashes, when as yet the vast Sierra in all his present grandeur, was not?

Conclusion.

I have abridged much, yet trepassed far, dear reader, in order to finish the northern trip with this fourth number. I cannot tell you of those other explorations westward; those perilous ascents of pinnacles never before scaled by man, or name the rare plants we brought away. I cannot present the scientific parties we met on our return to Big Meadows, nor even allude to the instruction there imparted by Dr. Harkness with his microscope. We were gone six weeks and traveled 400 miles, bringing in a wagon load of trophies, such as Dr. Gray requested. One of the new ones from the very summit of Lassen he named *Gilia Larseni*, in honor of my companion, John Larsen; and another, growing near the home of the Martin brothers, will be called *Harknessii Martinii*.

And now, dear reader, we have examined briefly some of the valleys and peaks—the decorative jewels, as I called them—of the broad breast of the Sierra. Need I name the last described? The volcanoes of the Lassen phalanx are the blazing stars upon the epanetes; the peerless Shasta is the Koh-i-noor in the crown of Picea Sierra!

RUBBER TREES.—The demand for rubber tires for omnibuses and carriages is again revived, and rubber manufacturers in London and Berlin now offer what is claimed as a strong, durable and elastic tire that will outlast iron on the heaviest traffic. The sanitary advantage of using rubber tires are so great that it is to be hoped this most desirable substitute is really made practical.

MECHANICAL PROGRESS.

Points on Boiler Making.

At the recent session of the British Institute of Mechanical Engineers there was a discussion on boiler making. Some of the points may be of interest to our readers. In the discussion Mr. Cowper remarked that most boilers were fitted much as Mr. Fletcher described when they were made by good makers, and observed that by having a short piece of pipe perforated at the end attached to the gauge cock you are enabled to tell instantly in the dark and by the sound alone whether steam or water was blowing off. He objected to the dome being done away with, but proposed that instead of cutting out the usual sized piece of metal under the dome, perforations only should be made, so that the shell need not be weakened. Mr. Adamson thought that the Manchester Steam Users' Association tests were arranged on an ill considered system. He thought accuracy in punched plates almost unattainable in the hands of skilful workmen, who would always make a seven-eighths inch hole to take a three-fourths inch hot rivet, and that often, especially on Mondays, the men were less sober than desirable, when the accuracy of their work was of course less. He advocated a drilled hole, and that particular attention should be paid to the strength of the rivets. He showed that Sir Wm. Fairbairn's investigations were not original when he first published them. Mr. Fletcher had said that it was not necessary to make the transverse seams stronger than was attainable by single riveting. He thought this erroneous conclusion had been arrived at by relying on the hydraulic test, but they must remember that a boiler does not work with frozen water, but with the steam up, and that in truth the mechanical action is greater longitudinally, so that the transverse seams require to be even stronger. Longitudinal stays were very useful, but the whole structure should be made as uniform as possible. The strength of the rivets as compared with the plates should be 24 to 17, and the plates should be carefully tested, especially across the grain. Credit was given to him for the wrought iron manhole monthpiece, but he never heard of a cast iron manhole monthpiece being used by locomotive engineers. The wrought iron monthpiece is now adopted down to 70 lbs. on the square inch pressure, but below that cast could be used. He believed the time was not far distant when drilled rivet holes would soon be used.

Drilled rivet holes were also advocated by Mr. Welker, of Leeds. He and Mr. Ramsbottom had ascertained six or seven years ago that the joints made with punched holes and hot rivets were not nearly so strong as those made with drilled holes and cold rivets. They also found that the common boiler gave quite as much steam as the Galloway boiler, and they were cheaper. He believed that the reason of the bursting of the cast iron monthpieces shown was that they were badly put on. Mr. Olrick agreed generally with Mr. Fletcher's remarks, but thought the present hydraulic test excessive and damaged the boiler, as it puts in flaws which gradually get larger. The test should never exceed 50 per cent. over working pressure. As to the stays they should be put on in such a way that they only come into use when the other parts begin to fail. He hoped that Mr. Fletcher would not confine himself to horizontal boilers only, but see to vertical also. Mr. Head advocated the use of vertical boilers. He had long had 19 in use, which worked well. Mr. Winch thought that punching need not be untrue if the differential dividing table were used, but some experiments had recently been made by Mr. Kirkaldy which showed that in punched plates the loss in strength was 67 per cent. greater than that represented by the material removed, whilst in drilled plates the loss was just equal to the material removed. Tested longitudinally the figures were: with punched holes 23,299 lbs., and with drilled 27,932 lbs., the difference being about 20 per cent. in favor of drilled holes. Tested crosswise the figures were 22,063 lbs. for punched plates, and 25,600 lbs. for drilled plates, or about 11 per cent. in favor of the latter. Drilled holes induced greater care on the part of the workmen; less iron was removed, and the iron around the holes was not damaged. Mr. Platt thought bad punching had been compared with good drilling, but still there could be no doubt that drilled holes were much preferable.

THE LARGEST IRONCLAD YET. — LONDON, April 29th — The most powerful ironclad vessel ever built was launched at Portsmouth on Thursday, the Princess Louise presiding at the ceremony. The new vessel, the *Inflexible*, is an immensely strong ship, but the 57-ton Krupp gun can pierce her through and through at 2,000 yards distance. When is this thing to stop? Even if it should be found possible to build a ship which would withstand the heaviest gun — and guns of 100 tons, with 19 inches caliber, are now being made for the Italian navy — every vessel is still liable to be sent to the bottom by a wretched little torpedo. The

Inflexible is 320 feet long and 75 feet wide; she has engines of immense force; she will have four guns of 81 tons each. She may be described as a monitor, 75 feet wide and 110 feet long, with walls 41 inches thick, floated by the addition of an unarmored bow and stern. The monitor, or citadel, is 12 feet high, half above and half below the water; within its walls are the engines, the boilers, the base of the turrets, the hydraulic machinery for loading the guns and the magazines. Her guns will carry projectiles weighing 1,650 pounds and measuring 16 inches in diameter. The launch was perfectly successful, and when the immense vessel took the water she was not a bad looking affair as she seemed to be when on the ways. — *Corr. N. Y. World*.

The Sheffield Decline.

English advices report a continued decline of business in the mammoth establishments at Sheffield. How a decline can be subject to treatment under our heading of "Mechanical Progress," is explained when it is remembered that a decline in the great Sheffield center means that progress is being made in the manufactures of the countries which have formerly patronized Sheffield. A correspondent of the *Ironmonger* gives the following interesting items: Markets which the older generation of the business men of Sheffield had to do with in their early days, which they assisted to build up and establish, and out of which they made considerable fortunes are now rapidly withdrawing their patronage from us, and giving it to younger rivals whose goods, if not altogether equal in quality, are much cheaper in price, and that in these days is a great consideration. We are more than confirmed in these observations by the official returns which have been published of his imports and exports for February. The imports of bar iron, iron manufactures, unwrought steel, and some other goods show a steady increase, and to that extent, of course, our own houses are losers. On the other hand, in our exports of hardware to Germany, Holland, France and the Spanish West India islands, India and Australia, we are holding our own, and in some instances the business of this year slightly exceeds that of last year. With what, however, might be termed the great markets of the world — the United States, Spain, South America and Canada — we are doing an ever decreasing trade. The total exports of hardware to these markets during the first two months of this year as compared with last year show a falling off to the extent of £40,000. The falling off in the various branches of the iron trade is even greater. The total value of our shipments of iron and steel in 1874 was £4,373,857; last year it was £3,707,830, this year, £2,935,397. The decline is most marked in reference to the exports to the United States. In the first two months of 1874 our shipments of hardware to that country amounted to £580,344, last year it was £296,820, this year the figures had dropped to £184,869. The only set off against this really alarming decline is an increase of about £20,000 in the value of machinery and old iron sent there. A similar state of things has unfortunately set in with respect to Russia; but some reasons can be assigned for this, and this hope is entertained that the tide will again turn, and that Russia again will be one of our chief customers. The falling off, however, is sufficient to excite the gravest apprehensions. The shipments of hardware to that market in January and February of 1874 were valued at £171,931, last year they were put down at £137,852, this year they only amounted to £52,040. Our manufacturers are hoping good will result to them from the Philadelphia exposition.

SAFE MAKING. — It appears that notwithstanding the many precautions taken by our eminent safe makers to prevent the possibility of any forcible opening of their indispensable manufactures, that the skillful and scientific burglar has lately adopted the method of destroying the works of safe locks by powerful acids, the introduction of which it is asserted renders both the copper and iron of the works soft and pliant in a few moments. To meet this new piece of scientific artifice, Messrs. Chubb & Son have now patented a new lock, which they claim to be so constructed that supposing the whole of the interior works, upon which the key acts, be destroyed, the bolt itself by which the door is held fast shall be left unmoved and perfectly secure. — *London Ironmonger*.

IRON SHEETS THINNER THAN PAPER. — We have heard of iron as thin as paper, but have just had a packet of specimen iron sheets brought to our office, not half as thick as the sheet is printed on. This sheet is .004 inches in thickness; the iron sheets we have received are .0015 inches thick, or only three-eighths of the thickness of the paper. At the same time the iron sheets are so tough as to be torn with difficulty, and so flexible as to bend with almost the facility of ordinary printing paper. These wonderful specimens of iron were made from the rough pig up to the rolled sheets by the Pearson & Knowles coal and iron company, whose skillful manager, Mr. Hooper, has discovered a means of rolling these infinitesimally thin sheets in numbers, without their sticking together. — *Warrington Guardian*.

SCIENTIFIC PROGRESS.

Method of Testing Irons and Steels.

We have, for a long time past, turned to account the action of acids on iron and steel, in order to ascertain their quality; but this action teaches us something further, it enables us to draw conclusions as to the regularity of the process of manufacture which has been adopted, and from this point of view it deserves a wide application.

Iron is, as is well known, attacked by all the common acids, and this action takes place in each of its numerous varieties, as wrought iron, cast iron, and steel; sometimes, however, portions are found which are scarcely, if at all, attacked by the acid, that is to say, passive, a property which is dispelled by bringing them to a red heat, and which has, besides, no connection with their good quality, since the best wrought irons and the closest grained steels are acted upon by acids.

Method of Applying the Test.

After several experiments with nitric, sulphuric and hydro-chloric acids, and their combinations, with mordants composed of the salts of copper, etc., Professor Kick, of Prague, has arrived at the conclusion that a mixture of one part of hydro-chloric acid with one part of water, to which is added a trace of solution of chloride of antimony, constitutes a mordant especially applicable to this purpose. The last ingredient, which was recommended to him by Professor Gintl, renders the surface attacked more capable of resisting oxidation, and has the effect, after well washing with hot water and the application of a coat of protecting varnish composed of Damar resin, of preserving the surface attacked sufficiently pure.

The method of proceeding is always to surround the surfaces, previously prepared by means of a file or hone, with a wall of wax fully three-fourths of an inch high, in the same way that copper plates are prepared for being eaten in with acid in engraving; the acid, heated to a temperature of 52 deg. to 86 deg. Fahr., is poured on to the surfaces, and soon begins to act, as will become manifest by the disengagement of gas. In winter, owing to the low temperature, the operation cannot be performed so favorably. Its duration is usually from one to two hours, and it should be continued, as a general rule, until the texture of the iron be exposed. The progress of the action may be easily ascertained by pouring out the acid every half hour without breaking the wax border, removing by means of a brush or piece of rag the carbon (graphite) deposited on the surface, washing, and again pouring on more acid if the action appears insufficient.

If the chloride of antimony has been added to the acid in proper proportion, but little time will elapse, after the action has commenced, before it will begin to throw down a black precipitate. This is easy to distinguish from the graphite, inasmuch as the latter is not very appreciable, when, for about one and three-quarter pints, is only added a single drop of the concentrated solution of chloride of antimony, which is sufficient.

When the action of the acid has been continued long enough, the wax wall is destroyed, and the surface of the iron is washed by means of a brush with several waters, the first of which is rendered slightly alkaline by the addition of a little lye; it is then carefully dried, and a coat of varnish is applied. If at the end of a few hours there are any signs of oxidation, the varnish must be dissolved with spirits of turpentine, the oxide removed, and the varnish again applied.

Indications Given by the Different Kinds of Iron.

Soft or fibrous iron when of very good quality is attacked by the acid, even when the action is continued for several hours, in a manner so uniform, and with an elimination of the carbon so limited that the surface acted upon retains a dull lustre; a few isolated specks and cinder-like holes being only observable.

Fine grained iron gives exactly the same indications; the surface generally remains uniform, but it is not quite so bright.

Coarse-grained iron and hot-short iron are attacked by the acid with much greater energy than the two kinds above mentioned. Even at the end of about 10 minutes, the surface, especially that of the latter kind, becomes quite black. If the acid be allowed to set for nearly half an hour, a black muddy deposit (*schlamm*) may be removed by washing, and no amount of washing will prevent the surface from remaining black; there will also be a considerable number of small holes distributed over the surface. Some portions of the iron are generally attacked more deeply in this way; others, although they may have become black and a little porous, are better preserved. This appearance will be the more manifest if, after about an hour's action, repeated washings and drying, a fine file be passed over the surface.

Malleable iron or annealed iron becomes rusty, as is well known, more readily than wrought iron; but an interesting fact is that the action of the acid is very violent and irregular.

The color of puddled steel, after being treated with acid and washing, is gray, and of a tolerably uniform shade, the weldings being but little apparent.

The appearance exhibited of blister steel is very like that of puddled steel, and the weldings are also but slightly apparent.

The surfaces of Bessemer steel and cast steel are uniformly gray, the non-homogeneous parts are rare and but little apparent. The softer the steel the more approaching to gray is the color. The action of the acid produces very fine fissures. In a sample of Mueset steel the prepared surfaces were perfectly uniform, but after the treatment with acid narrow transverse fissures were observed over the whole extent. It is probable that the proportion of titanium in this steel was the cause that the surface attacked presented the dark gray color.

Gray cast iron gives the same indications as steel. The attacked surface presents a tolerable uniform dark gray color. In spotted cast iron the white portions remain lighter, and the projecting particles of gray cast iron appear distinctly like black specks or spots.

The cases enumerated above will show the indications given by the principal classes of iron when treated with acid, and therefore the phenomena afforded by pieces composed of different kinds of iron will speak for themselves.

Professor Kick has given many examples of the appearance presented by the combination of different kinds of iron, and adds: "When in the forging of any piece different qualities of iron are united, the acid, when applied to the prepared surfaces, chiefly attacks the quality for which it has the most affinity, and to such an extent that its mordant action on the other portion is much less active than if these portions were exposed alone or singly to the action of the acid." Bessemer steel alone, submitted to this action, presents a gray surface, but, if it is welded to a coarse-grained iron, it is attacked in a less degree.

As to the results of the action of the acid in relation to the method of working iron, the foregoing remarks show that some light has already been thrown on the choice of different qualities of iron in the arrangement of the piles; they also point out that, even with the most simple piling, there is always a considerable crushing of the bands. It is nevertheless possible to draw from the appearance of the surface acted upon by the acid a conclusion as to the position of the bands or bars occupied in the pile. The more uniform is, or may be, the distribution of the pressure in the pile, the less will individual bands become disarranged. The Professor has come to the conclusion that the best method of forming the piles is that in which the welding is so perfect as to furnish the most satisfactory indications when submitted to the acid test.

In conclusion, Professor Kick admits that the samples on which he conducted his experiments were obtained from only one establishment, and that they were too few to admit of general conclusions being drawn from them; he believes, however, that he has conclusively pointed out the importance of this method of testing irons, as well for the manufacturer as for the consumer. — *London Ironmonger*.

WHAT CHEMISTRY HAS DONE. — Dr. J. L. W. Thudichum, in a recent lecture "On the Discoveries and Philosophy of Liebig," delivered before the Society of Arts in London, referred as follows to the position which this latest born of the sciences has already attained: "The youngest of the sciences or the youngest branch of sciences is chemistry, founded by Lavoisier and Dalton; developed by thousands of clear heads and nimble hands, it has in half a century become a recognized power in the affairs of man. It has materially improved his state, and enlarged his mind to conceptions of an elevating nature; it has become a ready test of his reasoning and working power. It has become the handmaid of almost all the elder sister sciences; of astronomy, teaching the composition of distant stars; of geology, teaching the composition and changes of strata and minerals; of physiology, vegetable and animal, teaching about food, nutrition, growth, changes, death and decay; of the healing art, teaching the nature of evils in the shape of disease, and the means of curing or mitigating them. This science, too, was developed by work — work physical and mental; its ways were often rugged, its endeavors misapprehended, opposed, suppressed. And the great men whose names are inscribed upon the roll of its principal promoters will be considered by posterity as benefactors akin to Hercules, removing evils, establishing the good and true."

RELATIONS BETWEEN HEAT, WEIGHT, AND VAPOR TENSION OF LIQUIDS. — M. Pictet has applied the mechanical theory of heat to the study of volatile liquids, making use of the experiments of Regnault, and reduces the following simple relations between their latent heats, atomic weight and vapor tension:

1. The cohesion of all liquids is constant.
2. The differential coefficient of the Napierian logarithm of the tension divided by the temperature is constant for all liquids when referred to the same pressure and temperature.
3. The latent heat of all liquids referred to the same pressure, multiplied by the atomic weight referred to the same temperature, gives a constant product.
4. For all liquids the difference of the internal latent heats at any two temperatures, multiplied by the atomic weight, is a constant number. It thus appears that quantities at first sight wholly independent are really connected by very simple relations, which dispense with long empirical formulas based on observations more or less open to criticism. Furthermore, admitting the law of Dulong and Petit for specific heats, we can further say that the latent heat of all liquids are multiples of their specific heats. — *Bibl. Univ.*

General News Items.

GUSTAV CONLET, the great scene painter, is dead.

Crops in Nebraska are suffering from drouth.

The dowager Duchess of Carnarvon, of Wales, is dead.

The Conservatives in Cork, Ireland, have carried the election, defeating the Home Rulers by a large majority.

A LONDON special to the New York Herald says the United States ship Franklin has arrived in St. Louis.

THE King of Hanover has been made a General of the British army, and the Crown Prince of Hanover's colonel.

The pictures and mosaics sent by the Pope to the exhibition have been entered in the American department by Archbishop Wood.

MARK TWAIN will preside at the opening of the California building, in Philadelphia, which takes place about June 15th.

THE House Committee of Congress has agreed to favor the purchase of \$20,000,000 of silver bullion, not to exceed \$1,000,000 at a time.

THE Senate Committee has agreed upon a bill which will practically restore the franking privilege on letters, documents and packages, under stringent regulations against the improper use of franks.

The President has issued a proclamation recommending the carrying into effect the late resolution of Congress for the delivery of local sketches of the country's progress at various places on the Fourth of July next.

THE delegation of 44 French workmen's corporations have united in refusing to accept the offer of the Government to relieve them of the expenses of sending a delegation to Philadelphia, the reasons for the refusal being that the Government demands the privilege of selecting the candidates.

DEATH FROM THE STING OF A SCORPION.—George Williams died near Tipton, Tulare county, on the 22d instant. While putting on a pair of overalls a large yellow scorpion, which was concealed in the garment, stung him twice in the leg. There were no symptoms of poison for several days, but at that time the leg commenced swelling, with the result as above stated.

Local News Matters.

ELEVENTH INDUSTRIAL FAIR.—The managers of this fair are determined that the Centennial ingredient shall be made manifest in a becoming manner, and it is to be hoped that exhibitors and visitors will do their part in sustaining this character. The fair will be open on Tuesday, August 8th, in the Mechanics' pavilion, which will be open for the reception of goods on Monday, July 25th. We are informed that the managers are now ready to receive applications from exhibitors for space at the office of the Institute, No. 27 Post street, in this city.

GOLD MINING IN SAN FRANCISCO.—Mons. Victor Ressayre, a resident of this city, has achieved sudden notoriety by the reported discovery of a gold quartz ledge on Bernal heights. This notoriety is not simply a local matter. Our exchanges of other States have given the alleged discovery due notice; in fact, the journals in the mining districts are less inclined to slight the matter than those of our own city. This being the case, respect for our brethren of the mining press would prompt us to give the matter a portion of our consideration. In our issue of next week we will give the readers of the Press the result of our observations.

OUR FUTURE MILLIONAIRES.—The New York World indulges in a comparison between the millionaires of California and those of New York, and the habits and advantages in money getting. "Vanderbilt," says the World, "is now the sole survivor of the three New Yorkers whose fortunes ranked with the great fortunes of the world. All this great wealth was the result of hard work, sagacity and economy, steadfastly continued during a long series of years. Nor can any of the great centers of civilization, London, Paris, Berlin and Vienna, furnish the names of three men who have, unaided, achieved such enormous fortunes in the short space of a life. The realization of such exceptional conditions for all manner of commercial and industrial enterprises here in the Eastern States during the remaining years of the century cannot be hoped for again. But over the mountains, on the shores of the Pacific, where untold wealth lies dormant in the bowels of the earth, only requiring the ingenuity and labor of man to bring it forth, there is opened a field for the rapid accumulation of wealth which hides fair to furnish us with California millionaires, some of whom are already among the rich men of the world."

COAL.—Charley Colburn has shown us some specimens of coal taken from newly discovered mines on the ranches of John and George Plank in Mendocino county, and D. W. Sroufe, in Humboldt county. The coal burns readily, and Mr. C. informs us that there is a vast body of it. It will not surprise us if valuable mines are developed ere long. The lack of transportation facilities at present would be a great drawback to the profitable working of the mines, but the time is not far away when this want will be supplied.—*Petaluma Argus*.

SHIPPING COAL.—The first schooner load from the Empire mine was shipped from the Granger wharf last week. The proprietors have contracted to furnish 150 tons daily. Some 80 men are employed at the mine, and 15 six-horse teams are required to transport the necessary amount of coal to the water front. The coal continues to be of excellent quality, and its success is assured. A railroad from the wharf to the mine is a necessity, and various other mines in the vicinity which will doubtless be opened within a few years, will contribute to its support.—*Antioch Ledger*.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

California.

AMADOR.

REVINO.—Sonora Democrat, May 27: The mines of Amador county are being reopened in many sections. The work on the working mines is being pushed forward vigorously and prospects in this direction are beginning to flourish. Quartz is looming up and will soon play a very prominent part in our mining interests.

FAIRBANKS.—Sonora Democrat, May 27: Rock is now being extracted from the 300-ft level at the rate of 80 tons per day, which is all the mill is capable of crushing at present. The ore is rather low grade, running about \$3 per ton. The monthly yield of gold reaches \$20,000, about one-half of which goes into the pockets of the fortunate shareholders. About 80 men are engaged in the mine and mill, and over \$10,000 is disbursed monthly for wages and other running expenses. Sinking operations are now being pushed ahead, with the intention of opening up a new level at a depth of 1,000 feet. The shaft is already down to that depth, but it is necessary to go 40 feet further to form what is called in miners' parlance a "snuff" for the drainage of water. It is expected that at the 1000-ft level the ore will run from \$10 to \$15 per ton, rivaling in richness that of the famous Keystone.

TO BE STARTED UP.—The Rising Star mine, near Placer Grove, will be started up almost immediately. The mine is owned by some Oakland capitalists, and is thought to be a paying one, although sufficient rock has never been taken out to test its value. Men have been engaged lately in putting up a house near the mine, and this being completed, mining work is expected to commence forthwith.

IMPORTANT DISCOVERY.—There is a ridge about a mile to the north of the town of Volcano which has been regarded as gold bearing by experienced miners. A tunnel was run some distance in the hill some years ago, but nothing of consequence was found and work was abandoned. Later the Lucas Brothers have taken up the abandoned claim and pushed the tunnel further into the hill. The other day they drifted into very rich gravel, the extent of which is not yet known. Some of the dirt has prospected splendidly. It is thought that an extensive auriferous gravel deposit has been struck, which will probably lead to the thorough prospecting of the ridge from other points.

CALAVERAS.

THE GRAVEL MINES.—Work is progressing steadily in all the claims with results that are in the main favorable. The well known Duray claim, in Chible gulch, is now being worked by tunneling two tunnels having a run of a distance of several hundred feet back into the hill and connected by a drift; a breast has also been started, quite a force of hands being employed in mining the gravel. Work is being steadily pushed in Velt's hydraulic on Tunnel ridge; he has used a good deal of powder during the present "run" with such favorable results that he has become an enthusiastic advocate of bank blasting. The explosion of powder not only loosens up the ground so that the hydraulic becomes very effective, but it also pulverizes the gravel, making it easier to wash. Moser is making sad havoc of the tailings in Spring gulch, having laid the bottom of the ravine bare for upwards of a quarter of a mile in length, and will clean the whole thing out before long. Some of the men engaged in these operations can be formed when we state that the tailings are about 40 feet in depth where he is at present engaged. Emerson, proprietor of the Happy Valley hydraulic, is nearly ready to commence piling; the task of opening the claim has been a heavy one, including the running of a bedrock tunnel 600 feet in length, and grading and building a road about three miles long. Some of the men engaged in these operations are getting old at patient labor and outlay; the tunnel is now completed, and as soon as the flume can be laid through it everything will be in readiness for piling. The tunnel is low enough to drain the mine in its deepest place, and as the claim is one of the most extensive and best fitted up in the county, we look for it to prove both profitable and profitable to the county.

THE NEW MILL AND TUNNEL.—Calaveras Chronicle, May 27: The new mill at long Brady mine—one of Cooper & Cowles' patent crushers—was started last Saturday, quite a number of spectators witnessing the preliminary performance of the machinery. A trifling misplacement of the belt pulleys, however, interfered with the preliminary trial of the mill, but all present were satisfied that it will prove a complete success. Monday morning an immense quantity of gravel was run into the mill, and the mill was kept running steadily ever since. The lack of an "agitator" to assist in getting rid of the pulp, however, has greatly limited the real crushing capacity of the mill, and as that want will soon be supplied, we defer further remark until the machinery is complete. The prospects of the mine are wholly favorable. The entire ledge—at an immense depth—is made up of the gold-bearing gravel, and a considerable portion of the ore is high grade. Rock taken from every part of the ledge "prospects" well, and the vein is so handsomely located that rock can be mined and milled at a merely nominal expense. The plates of the mill make a splendid showing considering the comparatively small quantity of rock that has been run through. When the mill is ready to work from 30 to 35 tons of ore per day, we shall be greatly at fault if the Brady mine does not prove one of the best paying enterprises of that character in the county.

READY FOR PILING.—Piling will be commenced in the Emerson hydraulic, happy valley, next Monday morning. The tunnel in the Happy valley mine has been kept running steadily ever since. The lack of an "agitator" to assist in getting rid of the pulp, however, has greatly limited the real crushing capacity of the mill, and as that want will soon be supplied, we defer further remark until the machinery is complete. The prospects of the mine are wholly favorable. The entire ledge—at an immense depth—is made up of the gold-bearing gravel, and a considerable portion of the ore is high grade. Rock taken from every part of the ledge "prospects" well, and the vein is so handsomely located that rock can be mined and milled at a merely nominal expense. The plates of the mill make a splendid showing considering the comparatively small quantity of rock that has been run through. When the mill is ready to work from 30 to 35 tons of ore per day, we shall be greatly at fault if the Brady mine does not prove one of the best paying enterprises of that character in the county.

WORK RESUMED.—Work has been resumed on the Livermore quartz mine, located near Jesus Maria, upon which operations were suspended last fall. Messrs.

Leyden & Boyle, both experienced miners, have taken a contract for sinking the shaft and commencing work. The mine has received the necessary pump, run by water power, and is now well fitted up for prospecting purposes. The company owning the mine have abundant means at their command, and are exhibiting a laudable degree of enterprise in its development.

RICH ROCK.—Monday last we were shown some very rich specimens of rock from the famous Grasshopper mine at Mosquito. The quartz was fairly studded with free gold in addition to being rich in sulphurets. The rock was taken from the 100-ft south level, which is now being run. Captain Woodworth, superintendent of the mine, informs us that the ledge averages 20 inches in width, and that he has 200 feet of "backs" in readiness to stop from. The work of sinking the main shaft goes steadily. No mine in the county has a more promising future than the Grasshopper.

CONTRACT LET.—A contract has been let for sinking the shaft in the Gwin mine a hundred feet deeper, and the contractors have commenced work. When the sinking is completed the shaft will be 1,200 feet in depth. In the meantime an abundance of rock is being taken from the 100-ft level, and kept in stock for use in the mill. An average of 100 tons of ore being crushed daily. The gross yield of the mine is from \$16,000 to \$20,000 per month, over one-half of the product being net profit.

EL DORADO.

GREENWOOD AND KELSEY MINES.—Democrat, May 20: From Kelsey, under date of May 17th, "R. B." writes as follows: I have lately been looking at the different mines between Greenwood and Kelsey, and will give you the results of my observations. The Taylor mining company, superintended by Mr. Hulford, has purchased the machinery of the Oederberg company, with which the work of sinking the shaft another 100 feet is about to be commenced. The present depth of the shaft is 400 feet, with a large ledge, showing considerable free gold and great quantities of rich sulphurets. The Rockcrans mine, which lies 600 or 650 feet south of the Taylor, is looking splendid. In fact, it is as good a mine as any in our county. This mine, after lying idle several years, was reopened last summer by N. D. Burlingham, under the most adverse circumstances, yet he built a snug five-stamp mill and sunk a shaft about 20 feet, and all the while the mine was being worked. He informed me that last winter was rather heavy for the profitable working of the mine, as he was deficient of machinery to keep the water out of the shaft; yet by perseverance he managed to keep even. The St. Lawrence mine, which has been lying idle for some 18 months, is about to be put in shape for operations under the management of Mr. Ransome, a practical miner of much experience. The sounding of the whistle at the mine to-day reminded our people of old times. We are satisfied that the new company and their superintendent mean business, and know what they are about. They went to get down to the 800-ft level to take out some more of that rich rock, of which there is a sample of about 25 tons in the mill, which shows free gold all through it. At the Mansfield mine, J. L. Smith, superintendent, a new hoisting engine has been put in position, and Mr. Smith will resume sinking at once. Under the influence of these enterprises our people are feeling greatly encouraged, and we expect lively times around this part of the country during this Centennial year.

THE CHAPARRAL MINE.—Democrat, May 27: Under date of May 23d, "R. B." writes from Kelsey as follows: I saw a communication in the Democrat of the 20th from "R. B." in regard to the mines of Greenwood and Kelsey, and the writer has not mentioned the Chaparral, which is now developing with the best of prospects. This mine is situated on the river slope, near Kelsey canon, and is owned by Messrs. Condo, Dickson & Poundstone. These men are practical miners, and doing the work on their mine with a view to permanency. They now have a shaft 40 feet in depth and are still sinking, timbering as they go with white oak. The ledge is now about two feet in width at the bottom of the shaft, and is gradually increasing. We prospected some of the poorest rock we could find, and in no one trial did we fail to obtain good results.

FRESNO.

QUARTZ NEAR DRY CREEK.—Expositor, May 24: We were shown a couple of days ago, by Mr. Armstrong, a large specimen of very rich gold bearing quartz taken from the claim of John McDowell & Co., near the head of Big Dry creek. He informs us that the mine is developing well. A lid ledge of quartz 1½ inches in width has been developed. The rock carries a considerable quantity of silver as well as gold. The mine is the richest of any that we have seen in the county.

INYO.

DEFIANCE MINE.—Coso Mining News, May 27: The new developments since last week have been made in the new shaft from second level north, where has been exposed a fine body of hard soft ore. This shaft has been sunk 25 feet since last report, its total depth now being 90 feet. The drift north from second level is showing fine bodies of ore. This second level drift is to connect with the main shaft north, there being some 200 feet yet to run to make the connection. There are now being extracted from the mine 40 to 45 tons of ore per day, which is a fine record of hoisting works. These works will be put in operation next Monday, when the developments in the mine will proceed more rapidly. Work in all other portions of the mine is going on as usual.

DEFIANCE FURNACE.—Furnace No. 1 has been running constantly and well during the week. There has been shipped for the Goodrich and Co. 75 tons of fuel. Furnace No. 2 has not yet been started, owing to the non-arrival of the water jacket, which has been delayed on the road two or three days longer than expected. It arrived yesterday, however, and will be placed in position and started to smelting next Monday morning.

ROSE SPRINGS.—From Mr. J. K. Maddock, owner in and assayer for the Goodrich and Co., whose mines are located in Rose Springs canon, we learn that on the Garibaldi the vein has been struck at the bottom of the incline shaft, which is down about 100 feet. The face of the drift at the point of the cross-cutting is in splendid ore, which assays \$600 per ton. There is no longer any doubt as to the continuity of the ledge, and its width is now shown by the cross-cut and evidences on the surface to be 70 feet wide.

ON THE NORTH STAR, situated five miles south from the Garibaldi, a shaft has been commenced at the mouth of the tunnel, and from fair average samples across the vein a shaft Mr. Maddock obtained by assay \$301, silver.

KERN.

WORK ON THE ANTIMONY MINE.—Courier, May 25: We have had the pleasure of a call from Mr. Bousbay, of San Emidio, who gives us intelligence of the good progress of the work at the antimony mine. Last week Mr. E. J. Weston, one of the chief owners of the mine, arrived from Los Angeles with 25 pack animals, for the purpose of packing ore from the mine to the furnace. Every preparation has been made for continuous work. Teams have been engaged for moving ore to the railroad. Supplies are going forward under the direction of Mr. Bousbay, who has reached the present working condition through innumerable difficulties. The beneficial effect the enterprise must soon be felt throughout the county.

NEVADA.

MINING NOTES.—Foothill Tidings, May 20: The work of repairing and enlarging the shaft at this mine has

been completed, and work has been resumed in levels below. The mill and machinery have been thoroughly overhauled and everything is in the best of order again. The lower levels are said to be looking better than ever, the ledge being large and of good quality. The new works on the Franklin Allison ranch are nearly completed and will be started up next week.

TULARE.

QUARTZ DISCOVERY.—Delta, May 18: On Thursday last a gentleman by the name of Corrington showed us a sack full of specimens taken from a recent discovery on the Yoko, at a depth of 100 feet. The rock is a little too glassy for a true silver bearing lead, but looks well for gold. Portions of the lead are, however, clouded with black sulphurets of silver; and the cavities of the rock are frequently filled with the yellow chloride of the same metal. The lead is six feet wide, and is one of that class likely to be rendered valuable by recent discoveries lessening the cost of reducing refractory milling ores.

MINERAL KING.—The future of these mines seems bright. Messrs. James Morgan and A. B. Tripp, of San Francisco, have bonded the Loop claim, on White Chief ledge, for the sum of \$300,000, and through their agent have already commenced the development of said mine, by way of contracting for 1,000 cords of wood for mill purposes, and are also erecting a large building that a smelting furnace of the largest capacity will be in successful operation on or before the first of September next.

TUOLUMNE.

TUOLUMNE MINING INTERESTS.—Union Democrat, May 20: The people of this county are almost inclined to grow weary of the good news that their resources in regards to the favorable condition of our quartz and gravel mines. Mines that have lain idle for years, or upon which assessments have been levied to defray the expenses of working, are beginning to look up again under proper management, and there is every probability that before the year closes will be paying large dividends in the way of requiring assessments. The most important information comes from the Sulphur mine of Bonshville, which during the past two months has cleared \$5,000 per month net, and will this month clear between \$8,000 and \$10,000, with rock enough in sight to run the mill three years. This rock is taken from a shaft, for the sinking of which requisitions have been made upon the company, but which it is estimated will now average at least \$100 per ton. Specimens of the rock which would pay between \$150 and \$300 per ton can be seen at the stores of Messrs. J. Hall and E. Richards. The work on the Sulphur mine will be vigorously prosecuted under the superintendence of Mr. Leachman, and it is expected that the rock will improve as the shaft sinks. Another piece of good news is from the Waters claim, near Salsburg, in the development of which thousands of dollars have been spent apparently to no purpose, the only result being the extraction of unreducible sulphurets. Some time since operations were commenced on a new shaft and the result has been the discovery of an eight foot ledge literally seamed with gold. The mill is now running, and the prospects of future large yields from the mine are very better. Sulphurets from the old shaft of this mine have been sent to Grass Valley to be reduced by the Fryer process, but no return has as yet been made. As far as prospects look, the Salsburg and the Gillis lead are in fine condition. We hear a report of immense yields in the Jones & Woodman claim, but the bottom facts are not apparent in this report and we cannot utter a word for their authenticity. The New Albany, near Summerville, is undoubtedly paying, and what is remarkable for the mines in this county, as well as being prima facie evidence of internal prosperity, is the fact that although important improvements have been made upon the property no assessment has been levied. We shall hear more of this mine before long. Prospecting on both sides of the river in the case of Carson and Jacks hills is being vigorously prosecuted, and those engaged in the work are more than content that their efforts will be rewarded largely. Capital is casting its eyes in our direction, and everything now indicates that our mineral resources will in a short time be vigorously and systematically worked.

THE JOE HOOKER QUARTZ MINE.—Independent, May 27: This mine, on Oalder's ranch, 10 miles east of Sonora, owned by Asa Bacon and L. D. Green, shows excellent prospects. The proprietors have run a tunnel 60 feet to the vein at 40 feet deep—run north 80 feet in the pay chute—the vein averaging 18 inches. From this chute they have crushed 11 tons, paying \$34 per ton. The rock they are at present extracting goes over \$100 per ton. The ore from the south chute mills \$18 and \$20 per ton free gold—pay chute 240 feet in length—two foot vein. The specimen brought for our inspection is encouraging, that near the surface, the (sulphurets being oxidized) leaves the gold plastered over the surface as thick as the pits on the skin of a small-pox patient. The rock at a greater depth shows galena, sulphurets and free gold. Some contend this to be a continuation of the Bonshville vein.

THE STAR MINE.—Owned by Jones & Woodman, northeast of Columbia, has recently been incorporated. They have sent three tons of rock to South San Francisco and had it worked by the Philadelphia process, and yielded \$411 per ton, or \$1,233 for the three tons. This rock was taken out at a depth of 120 feet in their main tunnel, heavily impregnated with sulphurets. This mine is one of the richest in the State, and the company propose to work it systematically and on a large scale.

The Carson Gate mine is looking up. The ore in the face of the tunnel at 310 feet is rich in golden sulphurets. By running the ore the gold is exposed in abundance.

Nevada.

WASHOE DISTRICT.

SOUTH CON. VIRGINIA.—Gold Hill News, May 25: This is an old location, or relocation, situated on the north side of the deep ravine at the lower extremity of American flat, near the railroad tunnel. A large amount of work has been done on it heretofore, and a very promising ledge is developed which assays well, and is likely to turn out pretty valuable.

GOULD & CURRY.—Repairing the shaft is slowly advancing, the work of tearing out the old timbers and putting in new being a much slower task than it would be to sink an entire new shaft of the same depth. It is not possible to do so. The preparation of the foundations for the new pumping machinery is going rapidly forward.

YELLOW JACKET.—Cross-cut No. 2 on the 1900-ft level is being steadily advanced, the face in porphyry. A drift north has been started at a point 225 feet east of the winze, to connect with cross-cut No. 2. The winze is 600 feet No. 1, on this level is down 24 feet with quartz in the southwest corner standing quite straight and carrying good ore. Sinking the north winze below the 1900-ft level has been resumed.

AMAZON.—A station is being cut out and a large tank put in to catch up the flow of water on the 300-ft level. The pumps will take the water from the tank and carry it back to the mill. Sinking the main shaft will be resumed as soon as the water tank is completed. The face of the main south drift on the 300-ft level is in vein material.

MINZ.—Sinking the shaft is making excellent progress. It is now down 1,493 feet, the bottom having passed through a very handsome vein of quartz several feet thick, carrying both gold and silver, and looks quite promising. The entire character of the formation is gradually changing, the whole of the material penetrated assuming a much softer and more favorable mineral bearing appearance.

ALTA.—Sinking the shaft had to be suspended during the first part of the week on account of an increase in the flow of water. The water, however, proved to be

only a pocket and is again rapidly receding. The erection of the new powerful pumping engine and other machinery is making splendid progress, the work being pushed with all energy possible at every point. The shaft is now down 425 feet.

UPPER.—The flow of water mentioned in our last report has become so great that it was found necessary to suspend sinking until the new machinery could be set to work. The foundations are already laid, and it is confidently expected that everything will be in readiness to resume work in the shaft in about ten days more.

EAST OVERMAN.—The shaft is actively being sunk, and the surface grading for hoisting works is completed. The bottom of the shaft is in the east range of the Comstock. In the vicinity of the Prospect, Occidental, Europa, and other mines of note, the location of this mine is a valuable one.

PROF.—During the week 15 feet have been added to the depth of the shaft, making a total depth of 272 feet. A small seam of clay and quartz, two feet wide, was passed through, from which came water enough to impede progress somewhat. Two loggers' drills are now working with good effect in the hard rock at the bottom of the shaft.

GLASGOW.—The ore developments in the bottom of the winze in the north drift, now being sunk below the 300-ft level, are of the most satisfactory kind. The ore body shows permeability and the quality continues good. It is the intention to immediately sink the shaft to the 300-ft level, and then to sink another level at a depth of a hundred feet more.

EUROPA.—Sinking the main shaft is making the usual good rate of progress.

CON. VIRGINIA.—Daily yield, 550 tons of ore. The ore elopes and breasts are showing well, and the quality of the ore is as good as at any time in the past. The yield of bullion for May was 100 tons, and the quality of the high standard of the stoppage of the Morgan mill for repairs during the past 26 days, and the adding of the Sacramento mill to the California, making a total loss of the run of two mills for the month. In addition to this, the extraction of ore has been somewhat retarded by repairs which it was positively necessary to make at the 150-ft station, and the rethanking of the shaft for a distance of 100 feet below that station. The erection of the new 80-stamp battery mill is going vigorously forward. The foundation sills and timbers are being placed, the boilers are enclosed ready to raise the smokestacks, and the frame of the entire works is almost ready to raise. Work on the new amalgamating mill is progressing well.

CALIFORNIA.—Daily yield, 300 tons of rich ore, keeping the California and Sacramento mills steadily running. The ore stopes are opening wider and richer than has ever been expected by the most sanguine experts who have ever examined the mine. No mine could be in a better shape for working or the extraction of ore. The north drift from the bottom of the winze below cross-cut No. 6 on the 1600-ft level, connected with the Ophir on Sunday last, greatly hastening the ventilation in every portion of the mine. The north drift on the 1400-ft level will complete a connection with the Ophir at that point in about ten days more, which will give as beautiful and complete ventilation of the entire mine between the 1400 and 1600 ft levels as it is possible to get. The yield of the mine for May will exceed that of the month of April by about \$100,000.

UPPER.—Daily yield, 150 tons of ore. This ore is steadily increasing the reserve at the mills. The ore-breasts on the 1600-ft level are showing splendidly at all points, the ore being of a fine quality and giving evidence of a steady continuation both north and south as well as downward. The north drift on this level is rapidly advancing to connect with the bottom of the north winze which is now being sunk from the level above. The drift has about 30 feet to run and the winze about the same distance to sink to complete the connection. The upraise from the 1300-ft level continues in quartz and low grade ore. The east cross-cut from the north drift on the 1100-ft level, running to connect with the upraise, is making excellent headway.

JULIA.—The south drift on the 1600-ft level has developed a large ledge of lively, healthy, mineral-bearing quartz of a high grade and character. When this ledge of quartz was struck a considerable flow of very hot water was encountered, which has now nearly subsided. The face of the main south drift on the same level is in much softer ground, with a strong seepage of water beginning to come in. On the 1600-ft level the face of the main southwest drift has encountered a flow of water, boiling hot, the temperature showing 180 degrees.

PICOT.—Thus far the main north drift following the hanging wall of the ledge has met with very favorable indications throughout, occasionally cutting through good little streaks and bunches of ore, evidently offshoots from the ledge. A station is now being out near the north end of the drift, at a favorable point, in order to sink a double winze or incline shaft. This is the only way to develop the ledge, but when this the true dip and inclination of it, and accurately determine the most judicious place for sinking the proposed large working shaft.

HALE & NORBROS.—The enlargement of the tank stations in the main shaft has been completed to the head of the incline, ready to receive the new and enlarged pumping machinery now being erected. The erection of this machinery is making rapid progress, the stone work being nearly completed, ready for the foundation sills and other timbers. A strong force of men are employed in the construction of these works, and the whole will be finished ready to start into operation at the very earliest moment consistent with its utility and durability.

BULLION.—The face of the northeast drift, on the 200-ft level of the Imperial shaft, has just cut the hanging of the ledge with every prospect of encountering the ore vein at any moment. The upraise from the 1700-ft level continues in very favorable ledge material, and is making good headway. Sinking both the main incline and north winze is going steadily forward without change of interest. The north drift, on the 1400-ft level, is steadily advancing.

FOURTE JONAS.—The water tank at the 100-ft station is completed, and sinking the shaft has been resumed with the usual energy. The excavations for the new pumping machinery is being advanced at as rapid a rate as possible. The pits for the heavy stone foundations will, when finished, be 21 feet in depth.

WARN.—The shaft has reached a depth of 100 feet, and the sinking is making splendid progress. The boilers are in place and enclosed, the smokestacks were raised yesterday, and the hoisting engine is ready to steam up at any moment. In fact everything is in complete readiness to start, were it not for a delay caused by the non-arrival of the reels at the proper time. These, however, arrived this morning and will be put in place immediately.

BROOKS.—Sinking the shaft is being crowded ahead with all possible energy. The material at the bottom is a mixture of a very promising description, and good progress is being made. A larger and more commodious hoisting work building is about being erected over the shaft and machinery.

SAVOIR.—Cutting out the stations in the shaft for the new and enlarged pump-hubs is going steadily forward. Laying the stone for the reception of the pumping engine is also making good progress. The new machinery being steadily prepared for placing in position ready for work.

PHIL SHERIDAN.—Sinking the main shaft is going ahead at a very rapid rate of progress, the bottom being in soft material and the work being pressed vigorously.

NACAPRA.—Sinking the main incline shaft is making rapid headway. It is now down 300 feet. During the week a vein of finely looking quartz a foot wide was struck in the bottom of the incline, carrying both gold and silver.

BELOCHER.—Daily yield 450 tons of ore. The ore stopes show but little if any change; in fact there is no alteration worthy of note in any portion of the mine. The foundations for the new pumping machinery are getting well advanced, and much of the machinery is already on the ground ready for erection.

DEBET.—Sinking the main shaft going steadily ahead, the bottom in good sinking ground. It is now down 55 feet. A commodious hoisting work building is now being framed and will be erected in a very few days.

NORTH CARSON.—The requisite survey for the long pipe from the main tunnel to the Virginia and Gold Hill water company, to conduct water for the supply of the new hoisting works will soon be completed.

CROLLAY-POTOSI.—Daily yield 110 tons of ore, the average assay value of which is \$31 per ton. Sinking the main incline is going steadily forward without change or hindrance. The east cross-cut from the south drift on the 1350-ft level is steadily advancing without change of interest to reward.

MORNING STAR.—Sinking the shaft is making the usual good progress. Superintendent J. R. Logan is now in San Francisco contracting for steam hoisting machinery. This machinery is to have a power sufficient to sink the shaft at once to a depth of 2,000 or more.

JURICO.—Opening up the drifts on the 800-ft level, preparatory to extending one lying between the 600 and 800 ft levels is going steadily forward. Sinking the main incline and driving the prospecting drift on the 1000-ft level are each making good progress.

DATTON.—Sinking the main shaft is going steadily ahead. It is now down 55 feet below the 700-ft level. Driving the north and south prospecting drift on the 500-ft level is making live progress. Opening out the 700-ft level is also getting well under way.

CROWN POINT.—The east prospecting cross-cut on the 1000-ft level is steadily advancing without a change of interest. On the 1700-ft level the main south drift is being driven forward, but as yet has developed nothing of paying value, otherwise there are no material changes.

BALTIMORE AND AMERICAN FLAT.—Sinking the main incline is going rapidly forward. Driving the north and south drifts on the 1050-ft level afford no valuable developments to report. The main east drift on the 1250-ft level is steadily advancing.

MEXICAN.—The north drift on the 1465-ft level has been stopped for the present. An opening is being cut on the west side of the ore found on this level, for the purpose of starting a winze downward to prospect the ledge between the 1465 and 1600-ft levels.

SIERRA NEVADA.—Sinking the shaft is going steadily forward, the bottom in fair working ground. Prospecting the 1500, 1250 and 1000-ft levels is being carried forward as usual with no important changes to report.

KOSUTH.—The water has been drained from the 600-ft level, and the drifts at that point are being rapidly repaired and put in good working order again. The flow of water is being kept down by a steady use of the pumps and tanks.

LARRY BRYAN.—The work of excavating for the foundations of the new machinery is steadily advancing. The pits for the stone work will be 23 feet in depth when completed, 14 of which had to be blasted out of the solid bedrock.

UNION CONSOLIDATED.—The face of the north drift on the 1500-ft level is still in very favorable quartz. The drift from the bottom of the winze on the 1455-ft level is steadily advancing in vein material of a very encouraging character.

OVERMAN.—Daily yield, 35 tons of ore from the 1100-ft level. Sinking the shaft below the 1200-ft level has been resumed. The station at the 1200-ft level is opened and a drift started to prospect the ledge.

SILVER HILL.—Sinking the main incline is going steadily forward, the pumps now handling the water with the greatest ease. The prospecting drifts on the 30-ft level north have developed no new or valuable features.

UTAH.—Sinking the shaft is going steadily forward, the bottom still in hard hasting rock. The rate of progress is better than it has been for some time past. The flow of water is gradually lessening.

ROYCE & REARD.—Owing to adverse developments encountered at the bottom of the shaft, and other adverse circumstances, further sinking is discontinued at present, or until the difficulties are settled.

ORIGINAL COMSTOCK.—The double working shaft being sunk to the eastward of the croppings to cut the ledge deep down among the pay ore, is progressing at a very fair rate, notwithstanding the hardness of the rock. The main drift from the ravine at the south end is also being pushed ahead lively to its intersection with the ledge.

LARRY WASHINGTON.—More and better looking quartz and other ledge matter appears at the bottom of the shaft, with a slight increase of water. Sinking goes on at the same lively rate as heretofore. The new pumping and other machinery is working as well as could be desired.

VIVIAN.—The ore-breasts both north and south, on the tunnel level, are showing a decided improvement. The usual quality of good ore is being shipped for milling. The water in the main incline is nearly drained ready to resume work.

IMPERIAL.—The ore body developed by the north drift and winze, on the 2000-ft level, is showing finely, and from sea to much greater extent as the drive opens up. Sinking the south winze is making good headway.

WEST BELOCHER.—The west drift is now in 312 feet, with the face in improved ore from last week's report. The northwest drift is in 200 feet, with its face in good working ground, allowing of rapid progress.

FORDE.—Good work is being done cleaning out and repairing the main drift at the 400-ft level, and the branch drift to the northwest is making excellent headway.

ROCK ISLAND.—The ledge developments northward on the 850-ft level still continue of a very encouraging character. No change on the 650-ft level.

STOCOR.—No changes in any of the prospecting drifts on the 650-ft level. Sinking the main shaft is making good headway.

CALEDONIA.—Sinking the shaft is going ahead at about the usual rate of speed, the ground in the bottom showing but little change.

TRONAN.—The hoisting works are all complete, ready for active operations, whenever the management see fit to so order.

GLOBE CONSOLIDATED.—Driving the north and south drifts on the 300-ft level as usual, the face of both being in lively vein matter.

BEAR & BELCHER.—Everything is at a standstill in this mine, awaiting the completion of the repairs to the Gould & Curry shaft.

NEVADA.—Some little improvement is noticeable in the face of the drift, more quartz and low grade ore coming in.

COSMOPOLITAN.—Face of main tunnel continues in good pay ore, as also does the top of the raise above this level.

DANEY.—The enlargement and repairs of the pump station at the 400-ft level are nearly complete.

LEVITATEAN.—Main drift at the 600-ft level being pushed forward energetically, with good ore indications.

UNIONTON.—Everything in and about the mine progressing as usual. No changes of importance.

MONUMENTAL.—Sinking the shaft is going steadily ahead, the bottom still in very favorable ground.

COLUMBIA.—The enlargement of the shaft is steadily progressing. Otherwise nothing new.

ORIGINAL GOLD HILL.—The rethanking of the shaft is being hastened to the greatest possible extent.

BALTO CONSOLIDATED.—Face of the drift still in favorable working material, and driving ahead.

KNICKERBOCKER.—Sinking the shaft is making the usual good progress.

(Continued on Page 364.)

Practical Objections to the Metric System.

Messrs. Colman Sellers and W. P. Pitman, a committee of the Franklin Institute, to whom was referred a circular from the Boston Society of Civil Engineers, asking the co-operation of the Institute in promoting the adoption of the metric system of weights and measures in the United States, have submitted a report which is full of interest and value. They give a minute account of this confused system that prevailed in France before its revolution, and made a change appear necessary. They also recite the difficulties that prevented the adoption of the metric system by the French people. The report proceeds as follows:

But whatever were the controlling reasons which incited the opposition to a change in France, they have much greater force with us from the absence of motive. We have no such confusion and diversity as the French had, and no such reform is called for. Our money is already decimally divided, and we enjoy already the chief benefits which the new system gave to the French.

If the measurements of the weights and the dimensions of substances, when ascertained, were only to serve as data for complicated calculations, the reasons for adopting weights and measures decimally divided would have controlled the practice long ago. This is actually the case with us in surveying land, which is measured by chains 22 yards long, divided into 100 links; in civil engineering, when submunkments, excavations, etc., are measured by yards and tenths, or feet and tenths, as the case requires; in the measurement of ships for tonnage, when the three dimensions are taken by feet and tenths; and in gauging casks, which is done with a gauging rod marked in inches and tenths.

But the fact is, that this vast majority of weightings and measurements are followed merely by mental calculations; or by a simple multiplication of quantity (whole or fraction) by prices (in decimals), a process which can often be done by vulgar fractions more easily than by decimals.

The meter is really as arbitrary a standard as the foot. About 80 degrees of latitude have been measured, but no two of them have been found of the same length, and there is good reason to believe that the length is not permanent in the same place. The only real thing about it is the rod in the public archives. The length of the meter is to be recovered, if lost, by comparison with the length of the seconds pendulum, and so likewise is the length of the foot or yard.

The meter was adopted in France for the lineal unit, in pendulum, only because the harmonious proportion between the meter and the length of the meridian would bring all local measurements into harmony with the measurement of the world, and would be a great assistance in geography and navigation; but the decimal divisions of the quadrant and of time having been abandoned, and the adopted length of the meter having been found incorrect, there remains not even a sentimental reason for adopting it as our unit of measure. Our own conveniences should be our guide, and overwhelming reasons forbid us to incur the confusion, labor and expense of attempting to make a change of that kind.

In the opinion of your committee the meter, in any shape heretofore adopted, is a less convenient instrument for measurement than a two-foot rule. You cannot fold it into four without breaking the sub-units. If so folded, it would be 10 inches long, which is inconvenient for the pocket. The meter is only decimally divided, whereas the foot rule, beside being divided into tenths and hundredths, is also divided into 12 inches, and gives the seven one-half, one-third, one-fourth, one-fifth, one-sixth, one-tenth, one-twelfth and one-one-hundredth of the foot, and the one-half, one-third, one-fourth, one-fifth, one-sixth, one-eighth, one-tenth, one-twelfth and one-sixteenth of this inch.

By changing our unit of lineal measure for the sake of uniformity with France, we should sever our uniformity with Great Britain, a country with which three-fifths of our foreign commerce is transacted.

The change in our units would entail much greater expense than is usually imagined. The measurements of every plot of ground in the United States have been made in acres, feet and inches, and are publicly recorded with this unit to the land, according to the record system peculiar to this country. Hundreds of years would elapse before we could permit ourselves to forget these old measures. Beside this, the industrial arts during the last fifty years have acquired a far greater extent and precision than were ever known before. Take, for instance, the machine shops, in which costly drawings, patterns, taps, dies, rimers, mandrills, gages and measuring tools of various descriptions for producing exact work and repetitions of the same, with interchangeable parts, are in common use.

It has been calculated that in a well regulated machine shop, thoroughly prepared for doing miscellaneous work, employing 250 workmen, the cost of a new outfit adapted to new measures would not be less than \$150,000, or \$600 per man. If, instead of changing the sizes, we adopt the alternative of giving the French dimensions to the old sizes, the irreconcilable discord between the inch and the divisions of the meter would furnish a precious example of the simplicity of the decimal system.

If new weights and measures are to be adopted, all the scale beams in the country

must be regulated and readjusted; the thousands of tons of brass weights, the myriads of gallon, quart and pint measures, and of bushels, half bushels and peck measures, and every measuring rule and rod of every description throughout the land must be thrown aside, and others, which the common mind cannot estimate, must be substituted.

The great mass of English technical literature would become almost useless, and must be translated from a language which we, and the nations we have most to do with, understand perfectly, into a new tongue, which is strange to most of our people. As a question of cost let those who advocate this change consider it carefully.

To the teacher, to the closet scholar, to the professional man, to those who never handled a rule or a measure, but only use weights and measures in calculation, it may seem merely a matter of legal enactment; but to the worker, the dealer in the market places, to those who produce the wealth and prosperity of this land, this question is a most serious one.

The Franklin Institute has never placed itself on record as opposing true progress; it has always advocated changes which were beneficial and not destructive. In this case a majority of your committee believes that the ultimate benefits of the changes proposed would be of less value than the damages during this transition. They think that the government of the United States has already done all that can fairly be asked of it by the most enthusiastic advocate of the metrical system, by making it legal. Those of us who choose to do so can use that system, and no one can object to it; but for the government to require us to use that, and no other, would be an arbitrary measure which we are neither willing nor able to bear.

The majority of your committee are of opinion, and so report, that the objections to the attempt to adopt the meter as a standard unit of lineal measure are overwhelming, whether we consider the compulsory means proposed, or this and be attained.

All of the objections to the metric decimal system do not apply to the adaptation of the decimal scale to our existing units. In the decimal harmony between the cubic foot and content of water weighing 1,000 ounces avoirdupois, whereby a cube of one-tenth of a foot on the edge becomes the measure of the ounce of water, we have the means of constructing a decimal system of weights and measures which would interfere the least with existing institutions. But your committee do not feel called upon to consider this branch of the subject.

Mining in Nevada County.

A recent number of this *Bulletin* contains a communication from a Grass Valley correspondent, from which we make the following extracts: Twenty-six years ago many of the miners in this vicinity, becoming excited about the quartz ledges so abundant here, gave up placer washing, at which they could then make good wages, and took themselves to quartz mining. Everything in the shape of croppings was eagerly located, the claims at first being taken up in square plats, after the manner of placer grounds, a mode that subsequently led to much trouble. In sinking their prospecting shafts a good deal of ore was taken out, these having been put down in the vein matter. As much of this ore contained free gold, these miners delighted to crush it in hand mortars and exhibit the result, always selecting, of course, the richest pieces for this purpose. So conducted, these crannings would sometimes yield as much as 40 to 50 cents to the pound of ore, beguiling the miner into the belief that a few hundred tons would suffice to insure him an ample fortune. Then these optimists cherished the pleasant theory that their lodes would grow richer with depth, nor did they entertain any fear but they should be able to save every particle of gold they contained. It was in this happy frame of mind, and so reasoning, that the writer found this community of miners on visiting them in the spring of 1851. Scarcely a year passed, however, before their hopes were blasted and their dreams of wealth dissipated. The two or three small quartz mills put up in the neighborhood were able to crush but little of their ore, and what little was crushed failed to yield even a tithe of what was expected. After they had sunk their shafts to a depth of 60 or 80 feet more water came in than they were able to handle, while the most of the ore after passing below the line of permanent water became so highly sulphureted or otherwise so debased that it could no longer be worked by the mill process then in use. Many of the ledges at about this level also pinched out, nor could any further traces of them be found below. In almost every case the wall rock proved to be excessively hard, rendering it very expensive to get out the ore, as the ledges were narrow, affording it in comparatively small quantities. Under these difficulties and discouragements vein mining here early fell into decadence, only a few of the many claims taken up having ever been explored with system or thoroughness. Within an area of 10 miles square about this town more than 2,000 quartz locations have been made, yet of all these not more than a hundred, perhaps, have been much explored, not more than half of this number having been brought to a remunerative or even moderately productive condition. One can almost count on his fingers the mines that have here been developed into largely paying and profitable properties. For 20 years or more one or two mines of this class have been in successful

operation at the same time, and so continued for a series of years, when they would give place to a new set, which came into bonanza as their predecessors passed into a condition of impoverishment, or more often of absolute sterility. The first to distinguish itself in this way was the Allison Ranch mine, which, coming to the front, maintained for several years a good reputation for productiveness. Meantime the Empire, North Star, New York Hill, Rocky Bar and some half a dozen mines of lesser note were earning more than enough to defray current expense, and enough even in some cases to pay handsome dividends. In 1864 the Eureka mine, two miles east of this place, took the lead as a billion producer, which pre-eminence it held for five years, when the ore-chutes that had given it enrichment passed out of this into the Idaho ground, adjoining it on the east. After enjoying for six years the distinction of being the first mine in the district, and one of the most profitable in the State, the fortunes of the Idaho have begun to wane, though it is still paying, and will, perhaps, for some time be able to pay very fair dividends. Just now the rising mines here would seem to be the New York Hill, Providence, Wyoming and Massachusetts Hill, all old locations, pretty well outlived and opened up, and some of which were profitably worked in the early days.

Hydraulic Mining.

While vein mining throughout this section of the State remains thus depressed, hydraulic operations are being greatly extended and prosecuted with unwearied vigor, nothing like the present activity and efficient execution having been seen before in this department of gold washing. Like every other class of mining, this has had its difficulties to contend with. It has, in fact, more than any other, been the outgrowth of hard necessities. Originating among themselves, our miners have had to learn this business wholly from experience, and, while they have not yet brought the system to perfection, every year bringing with it further improvement, they have nevertheless advanced it to a great state of completeness. It is calculated that the crop of gold dust harvested this year will largely exceed any heretofore gathered from our deep placers, intelligent authorities here estimating this increase at 80 per cent. on the product of last season, and 60 per cent. on that of any former year. To the following cause this anticipated gain, should it be realized, will be mainly due. In the first place, the body of snow lying on the Sierra Nevada and on the other mountains whence issue the streams that supply our mines, is unusually heavy. The most of this snow having fallen early in the winter, has since become so impacted by thaws and rain that it will long resist the rays of the sun, keeping the streams that feed the ditches and reservoirs well replenished until the summer is far advanced, and in some localities quite into the autumn. Within the past few years a number of ditches have been excavated for bringing water on the hydraulic grounds, some of these being of large capacity and only recently completed. Several spacious reservoirs have meantime been built in the mountains, while others previously constructed there have been enlarged. Through the aid of these additional ditches, a vastly increased quantity of water can now be delivered where wanted, while these new and enlarged reservoirs will supply the mines with water to a much later period in the summer than ever before, prolonging to that extent the season of active operations. It is now thought that piping will be continued this summer from a month to six weeks later than usual. Last year having been one of extreme drouth afforded this class of miners leisure for cleaning out and repairing their ditches and flumes, refitting their claims and putting them generally in good condition for making a long and uninterrupted run this season, while, as before observed, every year sees introduced into this process some new device, appliance or mode of procedure calculated to economize labor, increase production and add to its efficiency. That the current year, in view of these favorable conditions, will increase the gold yield to the extent estimated, seems probable.

THE DIGESTIBILITY OF MILK.—Dr. Carter, of London, in a paper on the digestibility of milk, after discussing various methods which have been generally used with a view of promoting its digestibility, points out that their efficiency is essentially due to the dilution of the casein of the milk, thus causing the precipitation, on its introduction into the stomach, in a granular form, of what would otherwise be firm, bulky, and compact. He has found, by experiment, that simple dilution with water is insufficient for this purpose, and that this object is far better attained by admixture of alkaline or starchy waters with the milk. He himself gives a decided practical preference to barley water for this purpose.

AMERICAN MACHINERY IN BRAZIL.—A member of the Brazilian Centennial Commission says the American cars are very popular on the roads in that country where they have been introduced. People dislike to travel on the line where are the close compartment carriages of France and England, since they have become acquainted with the light, airy and graceful cars sent out from America. Of agricultural machinery, the same regard to lightness may be made. There is no reason why the United States should not send out ten times as much as she does, except her own negligence of her interests.

USEFUL INFORMATION.

Figures for Fancy.

THERE is iron enough in the blood of 42 men to make a plowshare weighing 24 pounds.

Wild ducks are estimated to fly 90 miles an hour; swallows fly rather faster; and the swift flies above 200 miles an hour.

The cow eats 276 plants, and rejects 218; the goat, 449 and 126; the sheep, 387, and 341; the horse, 262, and 212; the hog, 72, and 171.

In man the temperature of the blood is 98 degrees; in sheep 102; in ducks 107; in ague it falls from 95 to 94; in fever it rises to 102 or 103.

THE beats in an hour of a common seconds clock are 3,600, and 17,280 a common watch; seconds watches beat 18,000 times an hour, or five per second.

WHEN man and woman have attained their complete development, they weigh almost exactly 20 times as much as at their birth, while their stature is about three and one-fourth times greater.

BUT two millions of species of land and water animals and plants are believed to exist. There are at least 100,000 species of plants, and 400,000 of insects only. The species in the seas are believed to be still more numerous. The number of polypi exceeds that of other insects, and the infusoria are not numbered, nor are the parasitic tribes. The species of the whole may even be five millions. If an old species became extinct, and a new one were evolved once a week, the whole would last 100,000 years.

ABOUT the age of 36 the lean man usually becomes fatter, and the fat man leaner. Between the years of 43 and 50, his appetite falls, his complexion fades, and his tongue is apt to be furrowed upon the least exertion of body or mind. At this period his muscles become flabby, his joints weak, his spirits droop, and his sleep is imperfect and unrefreshing. After suffering under these complaints a year, or perhaps two, he starts afresh with renewed vigor, and goes on to 61 or 62, when a similar change takes place, but with aggravated symptoms. When these periods have been successively passed, the gravity of incombent years is more strongly marked, and he begins to boast of his age.

Extraction of Oil from Olive Pulp, Etc.

Sir O. Sebright, British consul at Corfu, includes in a report on the trade of that place some account of the method adopted there whereby oil is extracted from the refuse of the kernels and pulp of the olive.

The method employed for crushing the olive preparatory to extracting the oil is of the most primitive kind. A vertical stone cylinder, of great volume and weight, attached to a shaft, is made to revolve by horse power in a slightly concave bed of the most solid construction. In this receptacle the freshly gathered olives are placed, and by the action of the revolving cylinder reduced to a pulp more or less comminuted according to the degree of pressure. The pulp is then removed and inclosed in flat, circular bags of about two feet in diameter, and then subjected to the action of a strong screw press, set in motion by a lever projecting horizontally, and worked by the united efforts of several men. When under this operation, which is most laborious, the oil ceases to flow, the now strongly compressed pulp is withdrawn and collected in heaps out of doors, where it is left to dry or ferment, according to the accidents of the weather.

Till recent times this refuse was occasionally employed as a manure, and partly used by the bakers for heating their ovens. For this latter purpose it was largely exported to Malta, where it fetched remunerative prices, and this traffic continued until it was put a stop to on the imposition of an export duty by the Hellenic government, which absorbed the whole of the profits previously obtained. The accumulation of this material in the islands, in all of which olive oil forms one of the chief products, had become enormous, in spite of the local consumption for the purposes above stated, when it occurred to some ingenious persons to subject it to a chemical analysis, with the view of turning its properties to some useful account. The result was that it was found to contain from two to four per cent. of pure oil. This discovery once made, in 1869 a firm composed of three enterprising capitalists was established, and works on a large scale were constructed with a view to extracting the oil. The process employed is both simple and ingenious, and has turned out a complete success. It consists in forcing at a high temperature the acid known as "bisulphuret of carbon" through a given quantity of the refuse, which after being reduced to a fine powder by being passed between cast iron rollers, is inclosed in an air tight metal cylinder of great strength, communicating with another receptacle or reservoir, also air tight, through which the acid is forced from beneath, carrying along with it the oil disengaged by its action. After a sufficient time allowed for cooling the reservoir is opened, when the oil, now of a greenish color, but almost odorless, is found floating on the surface of the acid, whence it is baled out and preserved in casks. The acid remains unchanged in its qualities, and but slightly diminished in quantity, ready, with slender additions, for operating afresh.

The quantity of oil thus obtained varies from

300 to 350 tons per annum, calculated to yield a net profit of over 24 per cent. on the capital engaged. The oil has been hitherto exported principally to Marseilles, where it is largely used in the soap manufactories, for which it is found highly adapted. On the score of economy, too, it has its advantages, as it is procurable at a price lower than that of the ordinary oil by about £10 per ton.

METHOD OF LACING A HEAVY BELT.—N. H. E., of Croton, New York, writes as follows to *Leffel's Mechanical News*: Perhaps some of my brother millers have been bothered with lacing up a thick heavy belt, and have it break apart in a week or ten days, and could not find out the reason of its doing so. Let me give my experience through your paper. I have a thick wide leather belt, 18 inches wide and one-half inch in thickness. The first time I used it I put the two extreme ends together, and laced with good strong leather, but it gave out in a few days. I then tried again with no better success, and not being satisfied kept lacing it with different kinds of leather, and spent a whole year in that way. At last I tried this way: Leaving the two extreme ends about one and one-half inches apart I laced with good horse-hide, such as I used in the first place, and I accomplished all I desired. My belt has since been in use over a year and I have not had to repair it in the least. I see tighter and the two pulleys are not over eight feet apart—but with the extreme ends a proper distance apart, so as to be pliable as it breaks around the pulleys, no harm is done to the lacings.

A THERM TELEGRAPH.—A cheap telegraph, useful for certain purposes, can be made in this way: Take two tin cylinders about the size of a small dice box, say three inches long by one and one-fourth inches diameter; cover one end of each with parchment or bladder, forming a drumhead. Pierce the center with a pin and insert a strong thread, and make a knot to prevent its being withdrawn. With the other end of the thread (which may be of any length, say 100 yards or more) do likewise with the other cylinder, and the telegraph is complete. By keeping the thread tightly drawn, in order that the vibration may be perfect, a person speaking or even whispering in one cylinder can be distinctly heard by another holding the other cylinder to the ear. Would not such home-made pocket telegraphs be very useful in fact or in arms, in the army, and in many other situations too innumerable to mention?—*Cor. Scientific American.*

A NEW mode of waterproofing woolen materials consists in boiling four and a half ounces white soap in two and a half gallons of water. Separately dissolve five and three-fourth ounces alum in two and a half gallons water. Heat these solutions to 190 degrees Fah. and pass the fabric through the soap bath, and afterwards through the alum solution. Dry in the open air.

LINING metal for axle boxes: Tin 24 parts, copper 4, antimony 8. Melt together, and add 24 parts more tin.

GOOD HEALTH.

Death of Dr. Hall.

Our Good Health column has been frequently enriched by the writings of Dr. W. W. Hall, the editor of *Hall's Journal of Health*. Dr. Hall died suddenly, falling dead in the street two weeks ago. The *Scientific American* writes of him as follows: Dr. Hall was born in Paris, Ky., in 1810. After completing his education he entered the ministry, and while performing missionary labors found a knowledge of medicine so indispensable that he began systematically to study the healing art. Subsequently he devoted himself to that profession, practicing successfully first in Cincinnati and New Orleans, and latterly in this city.

Dr. Hall possessed an extraordinary faculty for popularizing medical knowledge. He was the first to start a popular journal devoted to the inculcation of the laws of health and correct living, in which the articles were written in so clear and plain a style as to be comprehensible by any one. The fact that the *Journal of Health*, which was issued first in 1853, soon attracted a circulation of 25,000 copies, shows the favor with which the public regarded his labors. Dr. Hall prided himself on writing his whole paper unaided; and as he was master of a concise, epigrammatic way of expressing ideas, it was rare that a copy of the journal could be perused without some useful suggestion being fixed in the mind. Besides his editorial labors, Dr. Hall found time to prepare a number of valuable works on sanitary topics, which have added to his general reputation.

It is a remarkable fact that one so well posted in sanitary laws should have died through the violation of precepts which he perpetually urged upon others. It seems that for some years past Dr. Hall has greatly overtaxed himself in his literary labors, rising at five in the morning, and working almost continuously until ten at night. The physical results of mental overwork are fully known, and perhaps few understood them better than Dr. Hall himself. Yet he fell dead in the street, and subsequent examination has revealed the cause of his death to be degeneration of the heart, one of the commonest results, and according to recent investigations, an almost necessary consequence of an overtaxed brain.

Colors and their Effects upon the Human System.

In relation to Dr. Ponce's statement of the onrions effects of colors and the creative power of the solar rays upon Innacy and other mental diseases, Dr. Newberry, of New York, in a lecture before the Polytechnic American Institute, states that "The colors and rays of light relate to the physical temperaments as stimulants: the yellow color, or ray of light, to the nervous temperament, which is distinguished by a large brain and prominent motor, sensitive and sympathetic nerves; the pink color, or ray of light, relates to the nutritive temperament, characterized by large glandular negative and assimilating parts and an abundance of blood; and the blue color, or ray of light, relates to what I denominate the locomotive temperament, indicated by large bones and muscle, and predominance of the gelatinous tissue. The various temperaments may be stimulated by the colors or rays to which, as I indicated, they respectively relate, and are, therefore, capable of producing either a healthy or morbid influence upon different individuals. A person in whom the nervous system is dominant may have it increased or excited to prostration by the influence of yellow color, or ray of light. A nutritive-locomotive system may be developed so far as to counterbalance the excessive nervousness by the use of purple color, or ray of light. A weak nutritive system may be developed by the influence of pink color, or ray of light, while the same would be injurious to any one of plethoric nature. A weak locomotive temperament may be strengthened by the blue color, or ray of light, while the same would excite a strong person to work or make him irritable. The green color, or ray of light, excites the nervous-locomotive system; the red color, or ray of light, the nervous-nutritive. So that sick or unbalanced persons should have the color of the walls, ceiling, carpets, window-shades, etc., of their particular apartments properly adapted to develop an equilibrium of their physical temperaments, which is the only condition of perfect health and long life required by nature and overlooked by man. All our public assembly rooms should be of neutral colors, with pictures of various subjects to suit the different tastes, so as to produce a neutral effect in the aggregate, in order that each individual might be suited according to his sympathetic and comprehensive attraction."

Poisoned Air in Dwellings.

An exchange says: "A scientific man who takes great interest in the subject of drainage, holds that 'two-thirds of the miasmatic troubles in New York proceed from the kitchen sinks of the city houses. The sink drain gets clogged with grease, and foul odors arise to the upper stories of the houses, and little pale children inhale them all night, until they have scarcely strength enough in the morning to put on their shoes and stockings.' For want of a better remedy, says the *New York Sun*, a common brick placed over the aperture will nearly obviate the trouble, and it should be the duty of every sensible head of a family to see that it is regularly placed there. A woman says that is a man's idea. The duty of every head of a family is to see that the sink is kept clean and free from grease, and that from the drain no foul odors can be thrown back into the house to poison its atmosphere. This is very easily done by a plentiful use of washing soda to kill the grease and keep the pipes free from it, and the occasional use of chloride of lime to sweeten the drain. The cost is but little, and the enemy is cleared out instead of being bottled up, according to the *Sun's* advice. Keep your sink clean and the pipes free from dirt, then clap on your brick if you want to."

To this we add that there is no necessity that the children, or any one else in the house, should inhale such foul air all night; let them sleep with the windows open more or less, in proportion to the strength of the wind, and thus give admission to the outside air, shutting off the inside air of the house from their bedrooms if necessary, and the health of the family will not entirely depend on a kitchen sink.

FLUES AND VENTILATION.—At a meeting of the English Society of Engineers, a paper was read on flues and ventilation, by Mr. A. H. C. Trewman. The author pointed out in the first place, that, in order to keep an apartment in a healthy condition, fresh air must constantly be supplied at the bottom of the room, and the vitiated air as constantly removed. With respect to chimneys, the author observed that their size depended upon the dimensions of the room to which they belonged. A chimney should always be farthest removed from the doors of communication. After considering the theory of ventilation, and tracing the development of the chimney, from a hole in the roof to the more perfect arrangements of the present day, the author suggested two means of preventing air deflected from higher buildings from blowing down a chimney. The first was by placing a slab over the mouth of the chimney, and supported a few inches from it, small openings being made in the chimney at the sides and protected externally. The second plan was to place two converging plates in the chimney near the top, the smoke passing up between them, and any which might be blown back striking on the sloping plates and passing out through side flues. The author concluded by stating that an ordinary house flue should have an area of 18 inches by 14 inches.

MINING SCIENTIFIC PRESS

W. B. EWER.....SENIOR EDITOR.

DEWEY & CO., Publishers.

A. T. DEWEY, OEO. H. STROMO
W. B. EWER, JNO. L. BOONE

Office, No. 224 Sansome St., S. E. Corner
of California St., San Francisco.

Subscription and Advertising Rates:

ADVERTISING RATES.—1 week, 1 month, 3 months, 1 year.
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We wish to thank those subscribers who send in their renewals to the Press promptly as regularly as the year comes round. It saves us much expense in commissions for collections and renewals. May we not request more of our good patrons to do so!

THE ORIGINAL ARTICLES in this paper are mostly set in solid type, giving in our columns one-third more reading than is contained in ordinary leaded matter.

Our latest forms go to press on Thursday evening.

San Francisco:

Saturday Morning, June 3, 1876.

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MINING ENGINEERING.—Mr. Erich G. Gaertner, who has recently established himself permanently in this city to practice his profession of mining engineering, has opened new offices on the corner of Froot and California streets. Mr. Gaertner has had many years' experience, not only in Germany at the best metallurgical schools, but also in pursuing his vocation in Mexico, Nevada and California. He may be consulted by the mining community on questions relating to mining and metallurgical subjects, the erection of machinery, etc. He is also prepared to report on mines, test ores in the laboratory or on a large scale, or make analyses where necessary. His card will be found in our advertising columns.

NICKEL PLATED SCREWS.—Among the new articles which we present in our advertising columns to-day the nickel plated screw will be found. In articles where beauty and finish in the materials used is desirable, these screws have become largely identified. Car and steamboat builders, organ and piano forte manufacturers, etc., in the New England States—where facility of use and beauty of finish are leading points—have adopted them generally. Those who can appreciate the merits of the higher grades of builders' hardware are requested to peruse the advertisement referred to. By so doing they will be made acquainted with the advantages gained by the use of these screws in the points of durability, economy and uniformity.

THE CHINESE MURDERER.—On Friday of last week the Chinese murderer, Chin Mook Sow, was brought before the Fifteenth District Court for sentence, for the murder of Yee Ah Chin in this city on the 23d day of December last. The sentence was that he be hanged on Friday, the 21st day of July next.

The Mindeleff Process.

Its Theories and Practical Value.

To this age of progress, where all sciences advance at such a rapid rate, where inventions are crowding inventions, where electro-magnetic telegraphs and (alas!) Keelsy motors are springing up, one to last forever and the other to dwindle down to its origin—a tumbler full of water, it is the duty of the journalist to endeavor to discriminate between them, to test and try with the utmost caution, and to leave unnoticed and as unworthy of mention anything where the mysterious forms such an important part of the invention as to force the inventors to shy scientific investigation and to refuse to give scientific reasons for the effects to be produced. In this instance, ignoring entirely all sensational articles which have appeared in our daily cotemporaries relating to our subject, we shall restrict ourselves to an exact statement of the principles governing the reduction of ores by the Mindeleff process, what they can and what they cannot do for the bulk of the ore found on our coast, and whether the invention will benefit us in the reduction of rebellious and low grade copper and silver ores. It may be well to preface our remarks with the statement that the inventor of the process, who is at the same time superintendent of the works, has had no hesitation in giving us in detail the theories on which he bases the success of his process, and has given us every opportunity of closely examining the works in detail.

The Works

belonging to the company are situated close to the depots of the Central and Southern Pacific railroads at the southern end of the city. They are well constructed and evidently fitted up with an eye to permanency, costing, we are informed, upwards of \$12,000. The ore is first brought on to a platform, weighed, and put through a Blake crusher. It is then received into a car and run along the track to an elevator, where it is raised up to the drying chambers, into which the ore is poured. These drying chambers are simply brick ovens open at both ends, and directly below them are the two retorts, each corresponding to a drying chamber above. The ore being deprived of its moisture is then drawn out of the rear end of the chambers and drops by its own gravity into the upper end of the corresponding retort. The retorts are iron cylinders standing at an angle of about 30 degrees, so that the ore will slide down to the discharging point. The retorts are then hermetically sealed, heated, and the gas is introduced from below. At present the works are using gas from the city mains (C₂H₄) which is deprived of two equivalents of carbon by passing it through a cylinder filled with red hot coke and situated between the drying chambers and retorts. A gas burner on one end of the retorts is the means of recognizing (by the burning of the gas) when the operation is finished in the retorts. The escape of the gas is through a couple of cylinders filled with water and situated below. This not only keeps it under pressure in the retorts but also cleans the gas which forces through and admits of its being used over again.

When the charge in the retorts is finished the lower ends of the retorts are opened, and the ore slides down into a car at the front. The car is then run round to the elevator, where it is raised and the car run along again to the reverberatory furnace. After going through that the copper is brought across the building to the refining furnace.

In the case of ores containing both silver and copper, instead of being taken to the reverberatory furnace the ore is raised to the top of the building, passes down through three sets of leaching tubs to the precipitating box. It is then elevated again by a box elevator and carried along to the end of the building to be put through the Freiberg barrels and separators. The machinery receives its power from a 16 horse-power engine. A brick chimney 73 feet high connects with all the furnaces. In the west corner of the building is a neat assay office, with two assay furnaces and everything complete. Near by is the chemical room, in which analyses are made. In the yard is a gas meter, in which a supply of gas is kept. Of course, out of the city the company would make its own gas, but here it is found more convenient to use that provided by the gas company. The works are of substantial construction and quite complete.

We shall now consider the

Chemistry of the Process.

what ores can or cannot be united, what chemical changes they go through, and what advantages are gained or not gained over the old mode. Before doing so, however, it may be well to state that we have already given in this Press a detailed description of the process as far as the working of copper ores is concerned, but that was some time before the works were erected, and, in fact, when the process was first introduced to public notice.

All metallic oxides (with the exception of a few which are not comprised in the general list of noble and useful metals) are reduced by carbon or hydrogen to a metallic state, vapor (HO), carbonic oxide (CO), or carbonic acid

(CO₂) escaping. In ordinary smelting, carbon only is used, and derived from coal, the ores by the action of the heat are to a great extent desulphurized and oxidized and the metal is gained. But by the new process carbon and hydrogen both are brought into action and not only on oxides forming the above mentioned combinations, but also on sulphides (on the part of hydrogen), or chlorides and various others, and light carbonated hydrogen of the formula C₂H₄ is used for the purpose.

Lead ores of over 10 per cent. of lead can not be worked by the Mindeleff process, as the heat necessary for the action of the gas would smelt the ore and clog the retorts. They should as usual be worked in smelting furnaces, and are not affected by the new process.

A small percentage of lead would of course not be a hindrance to the process, but metallizes and adheres in globules to the ore.

Antimony ores come into the same category; a large percentage cannot be worked, a smaller amount evaporates.

Copper Ores.

Oxide of copper will very readily metallize, carbon as well as hydrogen combining with the ore and escaping as vapor, carbonic oxide or carbonic acid respectively, as above stated.

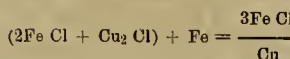
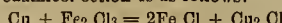
Carbonate of copper will at a moderate heat free its carbonic acid and remain an oxide, which is then treated as such and metallized.

The ores after being metallized are taken to the furnace, smelted and then refined; but the question arises in our mind if there is not just one process too much employed, namely, the metallizing. Carbonate and oxide of copper very readily smelt in coal with a slag, containing a fair amount of silica (if the same is not in the ore) and a so-called black copper results, which one refining makes marketable. Of course a cleaner copper is made by the Mindeleff process, but whether the advantage hereby gained is so great as to warrant the expense of metallizing, we are reasonably brought to doubt.

As to the most frequently found copper ore, copper and iron pyrites, we know that roasting cannot be dispensed with. Roasting means desulphurizing and oxidizing, but if such roasting is done in such a manner as to leave only metallic oxides, we can see no reason why these again should be metallized instead of being smelted as before mentioned.

For poorer copper ores the process may have some advantage, for instead of being smelted after metallization the same ore leached in the above described system of tubs by sesquichloride of iron of the formula Fe₂Cl₃ and metallic copper precipitated by metallic iron.

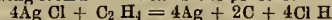
The chemical action is as follows:



The sesquichloride of iron in the first place changing into chloride of iron and carrying sesquichloride of copper in solution, then the chloride of the latter combining with one equivalent of iron, forming another equivalent of chloride of iron, while metallic copper precipitates. The chloride of iron is then by a blast of hot air and muriatic acid deprived of one-half equivalent of chlorine and sesquichloride of iron (Fe₂Cl₃) remains. During the process of leaching the same is used over and over again, until sufficiently charged for precipitation. This mode may be very effective where the ores do not warrant the smelting process, but there is again one operation which seriously impedes the work, namely: the iron which is generally contained in copper ores and which comes to the leaching tubs in a metallic state, is first dissolved by the sesquichloride of iron, and only after that the copper, for the reason that by the same substance one-half equivalent of iron is more readily absorbed than one-half equivalent of chlorine given up to the copper.

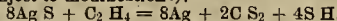
Silver Ores.

Argentiferous galena cannot be worked in this way, but must be smelted as above stated. Chlorides of silver the inventor claims to be able to work on the principle that the hydrogen of the gas combines with the chlorine, forming hydrochloric acid, which escapes, carbon dropping and metallic silver remaining. The following formula illustrates the process:



But why, we ask, the metallization of chlorides (iodides or bromides work similarly) when the same can be readily amalgamated without this process? Amalgamation has to be gone through with, and even considering that the ore by the gas process is greatly decomposed and the grinding of it facilitated, still it has to be ground and amalgamated, and we fail to see the saving.

On sulphides of silver the chemical action is entirely different. Sulphureted hydrogen and bisulphide of carbon is formed, while metallic silver remains. The following formula explains itself (we set for the various forms of sulphides of silver the formula Ag₂S, which is subject to modification).



For low grade ores which are sulphides without iron pyrites this process would be excellent, but unfortunately we have but few of these. Iron pyrites which are bisulphides of iron would have to be roasted before the gas process can be applied, and we are of the opinion that chlorination at once would bring the ores to just as fit a condition for amalgamation as the new process, besides doing away with one handling of the same.

But one kind of ore remains to be consid-

ered; that is where copper and sulphides of silver are contained in small quantities, and without many iron pyrites. Metallization of this ore would be in place, then amalgamation, and finally leaching would gain both copper and silver and be a decided progress in the metallurgy of low grade ores. And that appears to us as the sum total of advantages gained; Pansamint ores and similar ones could come into this class and might be advantageously handled. Low grade copper ores, but only oxides and arsenates, would also be benefited by the new process, notwithstanding the difference hereinbefore mentioned.

As to

Cost of the Gas Process.

We must say that it figures theoretically very low; 40 cubic feet of gas consume two volumes or 80 cubic feet of oxygen of a weight of eight pounds, corresponding to 32 pounds of metallic copper for the oxide and 64 pounds for the protides of copper. For sulphide of silver the same amount of gas would correspond to 108 pounds of metallic silver, and for chloride even more. Neither is the gas very expensive if the light carbureted hydrogen is manufactured, as one ton of coal produces from 8,000 to 12,000 cubic feet of the gas, and one cord of wood from 16,000 to 25,000 cubic feet of the gas; the expense of distillation is claimed to be no more than 50 cents per 1,000 feet, but this many times handling of the ore makes the process somewhat expensive, and the statement that one and one-half to three cents per pound of metallic copper and less for silver would be the approximate cost of reduction needs more corroboration and may be received with considerable caution. Then, again, the cost of erecting works is, for the little that they are able to accomplish, comparatively large, and we doubt whether the same of a capacity of reducing 10 tons in 24 hours can be erected all complete for less than \$25,000.

But notwithstanding all that, we confess that the whole undertaking is based on true scientific principles. We should regret if the venture should prove impracticable, if only on account of the energy and thorough study displayed by the inventor to supply a want long needed. The works are now in full operation, batches of various classes of ores are being worked, and we are of the opinion that any one who desires to examine the operation can do so without difficulty.

Gems and Precious Stones.

[Written for the Press by HENRY G. HANKS.]

(Continued from last week.)

C.—Chrysoberyl, Syn. Cymophane, Alexandrite.

This mineral is found in several varieties. The name chrysoberyl is from two Greek words, signifying golden beryl. When transparent and of a pure yellow color, it is highly prized as a gem. The variety known as alexandrite has an emerald green color as ordinary seen, while by transmitted light it appears columbine red. Another color may also be sometimes seen, a property known in mineralogy as "trichroism." Cymophane exhibits opalescence, sometimes seems to emit a peculiar bluish white light, which seems to emanate from the interior of the crystal. The common variety is of a bottle green color, being colored by oxide of iron. The "choesopites" of the ancients is by some authors supposed to have been the chrysoberyl.

By the following physical and optical properties the chrysoberyl may be recognized:

Crystalline form, orthorhombic; hardness, 8.5; specific gravity, 3.5 to 3.8; composition, (Be₂O₃ + Al₂O₃) alumine 80.2, glaucine 19.8 = 100.0.

Luster vitreous; streak uncolored, transparent, translucent, opaque, sometimes showing an internal opalescence.

Not acted on by acids, B. B. alone unchanged, with soda a slight surface action may be observed, with borax or microcosmic salt a very small fragment may with difficulty be fused. If the powdered mineral is moistened with a solution of nitrate of cobalt and strongly heated it takes a blue color. Possesses double refraction to a high degree. Becomes positively electrical, which it retains for some time.

The chrysoberyl is sometimes known in commerce as the "Oriental chrysolite." Another example of synonymy so perplexing to the mineralogical student.

The mineral is found in loose crystals and rolled pebbles in the beds of rivers in Brazil and Ceylon and Siberia; also in Connecticut, at Haddam in granite traversing gneiss, with columbite, beryl, garnets and tourmaline.

When found in river beds, it is associated with spinel, sapphire, beryl and topaz.

Apatite, fluor spar and adularia are sometimes mistaken for the chrysoberyl, but the latter may be distinguished by its hardness and by the facility with which it may be electrified by rubbing.

The chrysoberyl has been produced artificially by synthesis.

The chrysoberyl is not considered a gem of high character, although it sometimes commands a high price when exhibiting some peculiar beauty, or when taking the fancy of an opulent buyer.

(To be Continued.)

THE President has proclaimed the late resolution of Congress for the delivery of local sketches of the country's progress at various places on the Fourth of July.

[Editorial Correspondence.]

The Centennial at Philadelphia.

Progress of the Exhibition.

The weather for the most of the time since the opening of the exposition has been very unpleasant. It has rained more or less, nearly every day. We are now—Thursday P. M., May 18th—experiencing the third day of a continuous rain, with only slight pauses, at distant intervals. Of course such weather seriously affects the revenues of the exposition; for sight-seeing in a cold rain storm is unpleasant under the most favorable conditions. It is true that one might spend an entire day in admiring the wonderful display of the handwork of all nations as shown in the main building, or in examining and studying the almost endless variety of machinery in the building appropriated to that purpose; but the average visitor prefers to go about a little, for variety, and to get a little fresh air now and then, as a change from the smell of oil and steam, or the confined air overloaded with emanations from the bodices and exhibits of a world in miniature, such as is met with in the building last referred to.

The avenues and most of the minor paths about the grounds are covered with asphalt; but there are many exceptions, and all are just now badly cut up by the progress of "improvements" which are going on in all directions—laying down gas and water pipes, general road repairing, and the use of temporary or permanent railroad crossings, etc. Moreover, the avenues at best are filled with inequalities and depressions, which the water is sure to find and hold with the most provoking persistency. At the more distant points, such as the women's pavilion and agricultural hall, the march of improvement is so extensive and universal, and the mud so deep and stiff, that pedestrianism is almost out of the question, and so is the progress of the rolling chair. In addition to the inconveniences at the grounds, the trouble and disagreeableness encountered in getting there is worse than all else—the main street approaching the grounds is new and unpaved, without sidewalks and almost impassible with Philadelphia clay reduced to mud. This state of things drives almost everybody into the street cars, where muddy boots, wet overclothes and the steaming, stifled atmosphere of the overloaded vehicle is almost unendurable.

These inconveniences might be endured uncomplainingly for a while, were not "Old Prob" so tantalizingly reticent as to any favorable promises for the early future; so I suppose we shall have to keep ourselves with all possible patience, and quietly endure what cannot be avoided.

The Daily Attendance.

It is now said that the attendance upon the first day was greatly exaggerated—that the actual amount of money received showed a paying admission of only about 77,000 people. Since that time the paying visitors have averaged somewhere from 16,000 to 25,000 per diem—according to the state of the weather. The amount of receipts being somewhat less than half these figures, does not make a very encouraging financial exhibit, especially when it is known that the current expenses cannot fall much short of \$10,000 per day. It is said that about 1,000 special policemen are in the regular employ of the Commission. I understand, however, that the Commissioners are not particularly disappointed that the attendance has so far been less than was anticipated, from the facts already alluded to, and from the further fact that the attendance is much in excess of the corresponding days at either Paris or Vienna. It is confidently expected that a considerable increase of visitors will be observed from and after the middle of June; but there will be no large increase of those who come to study until everything is in perfect readiness.

The Noise of the Hammer and the Saw. Still mingles with the music, and is heard, in fact, all through nearly every building and portion of the grounds. Agricultural hall is perhaps the most backward in preparation. Whole sections in both agricultural hall and the main building are still covered with unopened boxes, and artisans are busy over the unfinished work of fitting up. The most of the American exhibitors and the English and their colonial brethren are in shape and busily employed in interesting and entertaining the numerous visitors at their respective exhibits. The Central Pacific railroad agent is still waiting for his lost car of goods. It is somewhere this side of the Rocky mountains, but just where I believe he can't find out. Many of the State buildings are also dragging slowly along, and notably so that of California, which, however, when complete will be one of the finest on the ground. The sections most tardy everywhere are the Spanish, Portuguese, French, Mexicans, Japanese and Chinese. There is no such thing as hurrying either of them. Slowness seems to be characteristic of the Latin and Mongolian races. But judging from what little they show thus far, their full exhibits will be unique, interesting and instructive, by way of showing to better advantage in contrast the progress of other nations.

It is plainly to be seen, however, that the

general exhibit grows more and more attractive with each day's advance. I hope next week to be able to commence my notes on the different buildings, each of which I propose to take up in brief detail. Shall send diagrams of the interior of all the principal ones, which will show the readers of the Press the exact position and relative proportions occupied by the different nationalities. These diagrams, together with the plan of the grounds, already given, and the accompanying description, will be found very convenient guides for persons intending to visit the exhibition—more useful, indeed, than any of the numerous guide books which are peddled on the streets and in the grounds and buildings. The readers of the Press will do well to preserve them carefully.

The State Buildings.

The various State buildings, as indicated in my last, are mostly situated in out-of-the-way places; yet a feeling of State pride and natural curiosity leads all visitors who come from the States which have erected buildings to look them up, and enter their names in the books of registry there kept. These buildings in most instances are costly, and yet of but little practical use or convenience. The buildings themselves, so far as the crowd of sight-seers are concerned, are mostly empty, and you may secure as much privacy in their reception rooms as was obtainable in the average San Francisco street or immediately after the late combination to raise the price of tickets. I believe there are now 25 of these buildings completed or in progress, as follows: Ohio, Indiana, Illinois, Wisconsin, Michigan, New Hampshire, Connecticut, Massachusetts, Delaware, Maryland, Tennessee, Iowa, Missouri, Pennsylvania, Vermont, Arkansas, West Virginia, Mississippi, California, New York, Kansas, New Jersey and Virginia. Nevada, as already stated, has put up her building, and occupies it practically with a five stamp quartz mill. She contributes, however, \$1,000 toward the California building, which will be used as a headquarters for California, Nevada and

the great days of the exhibition. The programme will be made out and published at an early day, so that it may be fully circulated throughout the Union in time to give ample opportunity for all who wish to prepare themselves for participation in such parts thereof as they may select.

Products of Oregon.

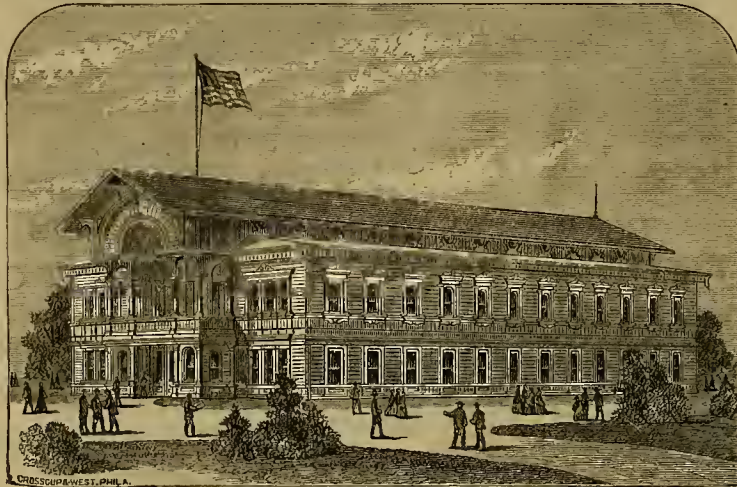
As Oregon is the only State or Territory on the Pacific coast which has yet completed her exhibit, I will close this letter with a brief description of the same. The managers of this exhibit are Mr. A. J. Dufur, State commissioner, and Messrs. C. E. Duhois and E. W. Ryan. They have erected and placed in order a magnificent pyramidal trophy, composed of the products of that State. The show is strikingly and tastefully arranged near the center of agricultural hall, with "Products of Oregon" conspicuously emblazoned on either side. The show attracts more attention and inquiry than almost anything else in the entire building. Notwithstanding every package and article is carefully described by a label conspicuously placed thereon, it still requires the almost constant attention of two persons to answer the numerous questions which are asked about the wonderful country which can turn out such productions. The exhibit is a splendid advertisement for Oregon and a practical display of her resources, from which she cannot fail to realize much substantial gain.

The various woods of Oregon are also tastefully displayed in the rough and in various degrees of finish. A section of cedar cut from a tree 198 feet from the ground measured 6.9 feet diameter; another, taken 103 feet high, measured 7.4 feet. It was very naturally inferred from such an exhibit that Oregon had "big trees" as well as California.

There is also a fine display of Oregon dried fruit—by the Alden process—which attracts much attention from its superiority over Eastern fruit dried by the same process.

A Novelty—Cider by the Yard.

I will close my notice of this interesting ex-



THE NEWSPAPER PAVILION.

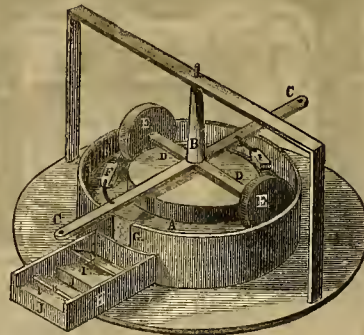
Oregon. Maine has established her headquarters, and opened a book of registry directly in the midst of her principal exhibit near the east end of the main building, where she is making a very excellent showing of her products and manufactures.

I fear the California building, although it will be quite as artistic and pretentious as any, will nevertheless be a poor place for the headquarters of the emigration bureau. Mr. Martin, I think, will find it to the interest of the cause he represents to establish his headquarters near the California and Oregon exhibit in agricultural hall—some three-quarters of a mile distant from the State building. He will find more inquiries after California there, in two hours, than in the other locality in an entire week. Mr. Scupham, of the railroad exhibit, has fitted up a very cosy little room within the lines of his exhibit, which, with a little enlargement, would make a very convenient, and decidedly the best location for the purpose which Mr. Martin has in view. The State buildings are failures so far as any practical value is derivable therefrom.

The Fourth of July.

It has been determined to make a great day of the coming Fourth. The Centennial authorities have already held several meetings for the purpose of discussing and arranging the details of a programme which shall be commensurate with the importance of the occasion. It is proposed that the demonstrations and celebrations to be provided for shall cover a period of some two weeks, and under the auspices of the Centennial management they will be so arranged that, if possible, no serious inconvenience can accrue to the general public on the Centennial grounds from overcrowding or otherwise. The anticipated rush of visitors upon the great national holiday, and during the period immediately preceding and succeeding it, has necessitated such an apportionment of the more conspicuous features of the great celebration as will supply a special programme for each day for at least two weeks. By this arrangement the rush which would otherwise be confined to the Fourth will be distributed over a number of days, to the manifest comfort and convenience of visitors on all

hibit by calling attention to an interesting novelty shown by Mr. Hampton Kelly. It consists of a roll of a leathery-looking substance, about the color and general appearance of jubbe paste. A small piece cut from the roll tasted very much as a person might suppose sweet cider could taste if evaporated to the consistency of a tough jelly. This, indeed, is just what the substance is. It is made by a process recently patented by Mr. Kelly, substantially as follows: The fresh juice of the apple, before it has undergone fermentation, is thrown, in the form of spray, upon a revolving sheet iron



Braid's Ore Crusher, Grinder and Amalgamator.

cylinder, kept moderately hot by steam, so that the water is gradually evaporated from the juice, leaving the condensed substance upon the cylinder, enveloping the same with a covering about one-eighth of an inch thick, which is then cut and peeled off in a sheet of uniform thickness, which may be rolled up like a sort of oil cloth, capable, to all appearance, of being kept for an indefinite length of time. The sample shown was made last fall. It is said that it will readily dissolve when placed in water, in which condition it forms a very palatable drink. About eight barrels of juice

is thus condensed into the space of one. As a new article of manufacture this substance may come into important use for various culinary purposes, to say nothing of its employment as a drink.

I send you an engraving of the newspaper pavilion, which is a credit to the newspaper interest of the country and to the enterprise of Rowell & Co., of New York, by whom it was erected. Visitors from far off regions will find their home papers neatly filed and ready to welcome them with familiar faces. Each paper can be found by referring to its number in the directory to the building. The Scientific Press may be seen at No. 311. W. B. E. Centennial Grounds, May 19th, 1876.

Improved Ore Crusher and Amalgamator.

We illustrate on this page an invention of interest to miners, made by Charles Braid, of Copperopolis, Calaveras county. It is an improved arrangement for crushing, grinding and amalgamating, and consists in the combination of crushing wheels, with a series of drags within a circular track. From this track the pulverized ore is carried into a flume or sluice box containing a series of peculiarly constructed riffles, where it is amalgamated.

By referring to the engraving the details of operation may be readily understood. A is a circular grinding track with a suitable surface for the purpose, and made of large diameter. A vertical shaft, B, stands in the center of the elevation of this track, and to the lower ends of this are attached the arms, C, for the attachment of animals for driving the machine. To the ends of the arms, D, are attached the crushing wheels, E, which rotate within the track as the arms are drawn around. To the arms, C, are attached the heavy weights or drags, which are thus made to follow the rollers around and pulverize the ore crushed by the rollers.

An opening is made at G in the side of the outer rim of the pan, which encloses the track, and provided with a suitable screen through which the pulp passes as fast as it becomes fine enough. This pulp, together with sufficient water, is carried by a trough or pipe to the sluice box, H, into which it falls and passes over the peculiarly constructed riffles. These riffles consist of inclined planes, I, which the inventor finds to be very suitable when made about four feet long by about one foot wide, and having a rise of about one inch to the foot. From the top of each incline the water and pulp fall down an abrupt face, J, to the foot of the next plane, and so on. The quicksilver is put on the space at the foot of each plane, and is partially retained by means of the inclines, but the falling of the water into these spaces is apt to carry some of the valuable metal up the incline, and it will eventually be lost. To prevent this, the plates, K, are employed, which are placed across the flume and stand at an angle, their upper edges being advanced beyond the lower edges as shown. These plates are so placed that the water and pulp fall from the top of each incline into a space between the face, J, and the plate, and all eddies, currents and splashing take place within this space. From this the pulp is forced down through the mercury, into which the edge of the plate just dips, and then flows gently up the incline, with no tendency to carry off mercury or amalgam, and by this device the inventor saves so closely that he avers that he is enabled to find any traces of mercury or gold in the lallings below the sluice. The sluice may be placed close against the side of the grinder, or, as will be most convenient, it can be set at a short distance away and connected by a pipe or trough so as to leave room for the horse which drives the crusher to pass readily.

This invention has been patented through the MINING AND SCIENTIFIC PRESS Patent Agency. The inventor does not claim separately either the use of wheels or rollers moving in a circular track, or the use of the weight or drag, but he claims certain specified combinations. The machine can be attached to any other crushing machinery and reduce the ore rapidly to an exceedingly fine condition. It has been well tested, and can save the finest flour gold. The machine has been used for six months steadily at one mill, and one-third of the gold taken out was saved from the waste by this amalgamator. The inventor is an old miner and mechanic, and has paid great attention to the subject of saving gold. The machine is cheap, simple in construction and not liable to get out of order. It can be used with profit in cement and placer mines. It is easily packed from place to place, and readily adjusted. The inventor is ready to take it around to work tailings to prove its usefulness. Quite a business could be made with one of these machines in gleaming from old diggings. State, county or individual rights to use this machine can be bought on reasonable terms. The inventor may be addressed as above for circulars and further information.

Mayor Bryant, Mark L. McDonald and R. C. Page of this city, with Robert Denton of Los Angeles compose the "Star oil works company," which, with \$1,000,000 capital, is building an oil refinery at Ventura.

THE VIRGINIA GOLD GRAVEL MINING COMPANY, whose mines are located near the Dardanelles company, Placer county, have recently planted new machinery on the ground and recommenced work after a lapse of many years.

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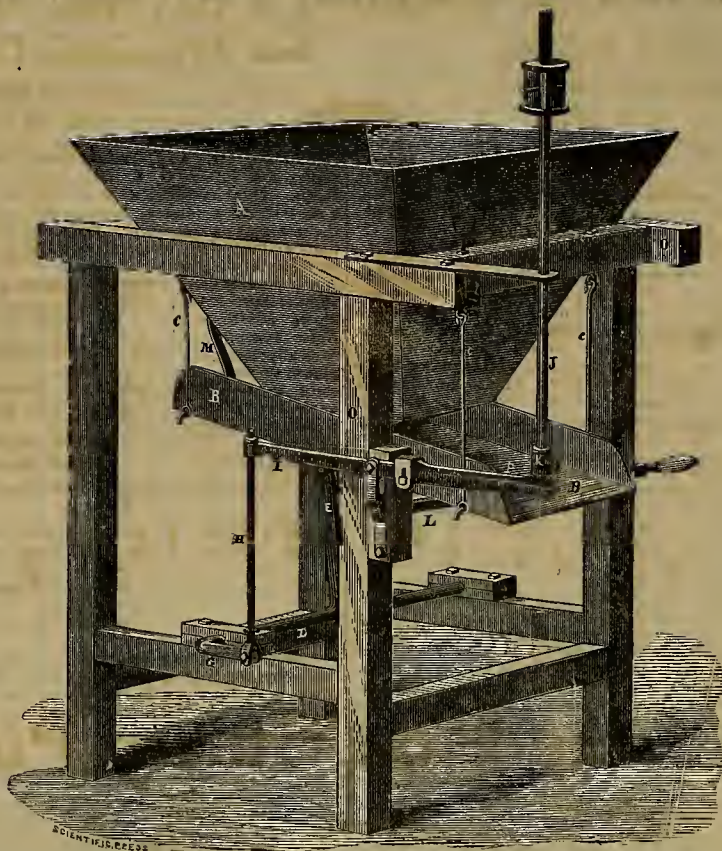
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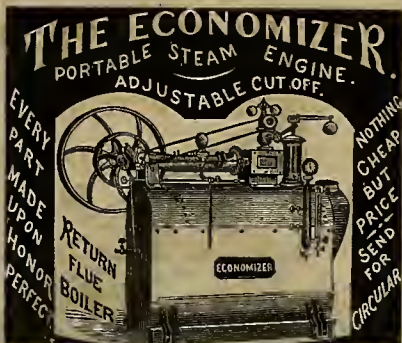
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proper shape for working in cupola furnaces.Cost of Roasting and Chloridizing by this
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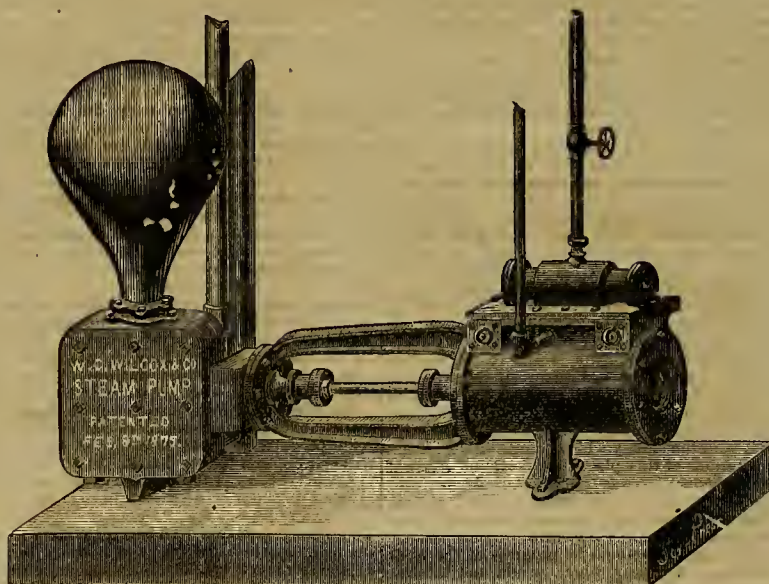
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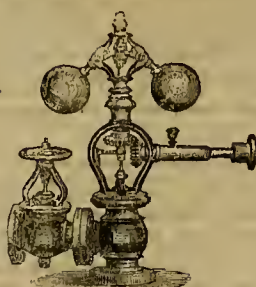
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IRON PIPE AND MALLEABLE IRON FITTINGS.

ALL KINDS OF

WORK AND COMPOSITION NAILS,

AT LOWEST RATES,

16-17

(Continued from Page 358.)

ELY DISTRICT.

ALPS MILL.—Pioche Record, May 23: The Alps mill for the last 15 days has been crushing 20 tons of ore daily and running steadily six pans.

BULLION SHIPMENT.—Wells, Fargo & Co. shipped bullion yesterday valued at \$3,822.

RAYMOND & ELY MILL.—The Raymond & Ely 30-stamp mill at Bullionville started on Saturday to run to its full capacity, that is the 30 stamps. For some time it has only been running 15 stamps.

TOCQUEVILLE ORE.—Dufferin, Forsythe, Dodge and Pinkham arrived yesterday in Pioche with a large amount of ore from the Toquerville mines, which will be worked at the Alps mill.

RIOB ORE.—Joe Gargus, an old prospector and miner in these diggings, a few days ago brought to town some very rich specimens of ore from White Pine mountain. It was free milling ore, and would average not less than \$5,000 per ton, and he claims to have lots of it in the mine. The name of the mine has escaped our memory, but it is located on the west side of the mountain and not far from the celebrated Trench mine.

Arizona.

MIOA.—Miner, May 20: While at the Peck and Prince mines last week we saw sheets of mica, popularly known as isinglass, several inches square and in layers two inches thick, taken from a ledge of that material, by Mr. White, not far to the eastward of the Prince and Black Warrior.

NEW CLAIMS.—Gila, May 13: The following mining claims have been recorded during the week in Recorder S. W. Carpenter's office: May 6th, Bombach's Black Lead mine, two and one-half miles south of Camp Bowie, located by Otto Bombach. May 11th, two placer claims in the Smith mining district, located by T. Armstrong. Placer claim, Granite mountains, located by E. D. Hudson, C. Bent, W. Buck and F. C. Jones.

Colorado.

SAN JUAN MINES.—Colorado Springs Gazette, May 20: The rush to the San Juan mines is still on the increase. More are passing through this week for that country than during any previous week. So far as we have been able to learn, they are about equally divided between the Lake, Animas and Uncompaghe districts, with a few to the La Plata and San Miguel. The most encouraging prospect of the present time, and for the future, is the large amount of capital which is now coming in for investment in mines and works. The apparent rush to distribute over almost the whole mining range of the Territory, but the bulk of it, at present, attracted to the several districts of San Juan.

PARK COUNTY.—Lone Star mine, Mosquito district. The shaft of this is now down 150 feet and levels are now being run at this depth. It is the intention to continue the level on the lower side to the surface, and then work the mine through this drift. This will not only deepen the mine but also give it ventilation to the mine. The ore of this mine has steadily increased as depth has been gained. At the present depth native silver in considerable quantity is found.

SUMMIT COUNTY.—Messrs. Willey & Clary have effected arrangements for developing the Tiger, Tiger Extension and St. Cloud lodes, situated on Glacier mountain, Snake River district. These are among the most prominent lodes in Summit county, and lying as they do, between Montezuma and St. John, are most advantageously situated as regards market for ores.

Idaho.

LOCAL MINING NEWS.—Statesman, May 27: The finest looking gold brick that has been seen in this vicinity for a long time was made up by Simondt on Tuesday from Belle Peck crushing. Its total value was \$10,202.73, the proportion of which in gold was \$9,574.23 and the value to the ounce \$11.56. There were 72 tons of rock used in making this bar, resulting in an average of nearly \$142 to the ton.

COAL CRUISE.—Everything is flourishing in connection with this mine. The workmen have just received another month's pay and are happy.

FRANKTON MINES.—There has been unusual hustle and activity in these mines for the past fortnight. There is not an idle man in the new camp.

SOUTH MOUNTAIN MINES.—The mines that are being worked in this camp are looking well, and the great impression is that the new company controlling most of the mines here will have a force of men at work in a few weeks, but this furnace will not probably be started before the month of August.

THE POTOTI.—Mr. Peck informs us that the Pototi is looking first-rate, and he has every reason to believe that developments will show that he has got just as good a thing here as he has in the Belle Peck.

Montana.

A GOLD LUMP.—Independent, May 28th: Our reporter saw yesterday at the banking house of Hirschfeld & Co. an egg shaped lump of refined gold valued at \$4,000. It came from Last Chance gulch, and is of superior quality and fineness.

Utah.

MINING NOTES.—Salt Lake Tribune, May 26:—Six of our mining districts will turn out more than the usual amount of refined bullion this season. These districts are Uintah, West Mountain, Tivito, Ophir Camp Floyd and Leads. The placer diggings of Bingham are well supplied with water, and are said to be panning out well. The Camp Floyd mill is running regularly on ore of this district, and is doing a nice business. The Bay City run of which is delving beneath the Emma, has a vein of ore 20 feet wide between well defined walls. The ore assays away up in the hundreds, Utah, during the month of March, which is regarded as the worst in the year, produced \$745,000 worth of base bullion, \$75,000 refined bullion, and \$4,000 copper—making a total of \$824,000.

A Weekly List of U. S. Patents is sued to Pacific Coast Inventors.

FROM OFFICIAL REPORTS FOR THE MINING AND SOLE TITLES PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.]

By Special Dispatch, Dated Washington, D. C., May 30th, 1876.

FOR WEEK ENDING MAY 16TH, 1876.*

WELL BORES.—John Milton Creal, Los Angeles, Cal.

SHACKLES.—William H. Lininger, Salem, Ogn. **HYDRAULIC NOZZLES.**—Henry C. Perkins, North Bloomfield, Cal.

TRACE FASTENERS.—William Quinlan and Alexander Peere, Mayfield, Cal.

TRANSPLANTERS.—Robert L. W. dney, Los Angeles, Cal.

SLEEPING CARS.—Emmanuel Blochman, S. F. Cal.

ADJUSTABLE BOLSTERS FOR BEDS.—Jacob Hoffmann, Portland, Ogn.

ADGER HANDLES.—James Mayers, Gervais, Ogn.

WINDMILLS.—James Ward, Winnemucca, Nev.

Virginia City and the Comstock Mines.

NUMBER FIVE.

[By our Resident Correspondent.]

The next in order to claim attention as we follow the lead south is one of the best known as it is also the oldest well defined location on the Comstock. The Ophir was a portion of the ground which in 1859 came into the possession of Comstock and his partners, and it was through this claim that his name was given to the lode. About 1853, the Grosch brothers claimed to have discovered silver ledges and located a claim where Virginia City now stands, calling it the Pioneer, and the present Ophir ground is a portion of this. There has always been some doubt whether the Grosch brothers or Finney (known as old Virginia) made the first location. The original notice of location made by Finney was found and published, but that of the Grosch brothers, though said to be in the possession of private parties, has never been produced, hence it was impossible to compare dates. But neither was sufficiently permanent or distinct to be perpetuated, and the Ophir, being able to trace its origin and progress in an unbroken line from the time it was worked by John Jessup in 1859, for gold, has an undisputed right to be called the oldest. After it was fully established that there was an immense wealth of silver as well as gold in the ledges, in 1860, the Ophir company was incorporated, and work begun in a shaft due west of the present works, and well up the side of the hill. In those days the vein was thought to pitch west and would be found far under Mt. Davidson, and western locations were as much sought after as are the eastern to-day. This shaft was worked from the date of the incorporation of the company to 1867, during which time a depth of 700 feet was reached, striking that ledge which is called in Commissioner Raymond's reports the third ore body. This yielded immense quantities of rich ore, and in some places was of great width, but gradually narrowed down, and at 700 feet pinched out entirely. During this working the company was enabled to pay dividends aggregating over one and a third millions.

In 1867 the old shaft was abandoned and preparations made to work in the new one on a much larger scale, and from that time until the destructive fire of last October, prospecting and exploring was vigorously prosecuted. When the new shaft was begun there was a better appreciation of the extent to which mining would be carried in this district, and consequently arrangements were made for operations of much greater magnitude. Hoisting works and pumping machinery of greater capacity were provided, and the shaft was made with four compartments—three to be used in hoisting and one as a pump shaft. The fire destroyed, of course, everything that could be burned on the surface, and damaged a great deal of the machinery—some of it irreparably; but with the energy which characterize all the operations at this place, the work of renewal and renovation was immediately begun and rapidly pushed to completion, until at this date you would have to search elsewhere than at the Ophir for any traces of the great fire.

Instead of tracing the progress of the work through each year, which would not interest many, the effort will be made to give an accurate account of what has been accomplished by describing the present condition of the mine, though despairing of giving to any one, not familiar with this work, the clear idea of it which was imparted to me by means of an impromptu chart and an exploration of the mine. The whole depth of the perpendicular shaft is at this date 1,640 feet; though there is a 1700-foot level reached by a shaft from the 1465-foot level, 360 feet east from the main shaft. There were several levels above and at 500 feet, with a good deal of drifting, but being of little consequence and showing no developments they were not cleaned out after the fire. The 700-foot level was also of no consequence, beyond the fact that here the largest body of water was found, and the largest tank is situated. The next level is at 1,100 feet. A great deal of work was done here in 1872, there being encouraging indications that the rich ledge would be found. The vein was exposed for 83 feet north and south, and 200 feet east and west; the eastern portion being nearly all quartz. Work on this level at present consists of cross cutting east. At 1,300 feet there are no special developments. From this level there is an upraise to the 1100-foot level and from the upraise, 50 feet above the 1300-foot level, there is a connection with the California mine all the way in ore. At 1,360 feet another connection is made with the California, and a third on the 1465-foot level, both in ore. On the 1465-foot level a great amount of work has been done. It is from here that connection is made with the Mexican north, for the prospecting of that mine, as well as with the 1600-foot level of the California south. What appeared to be two ore bodies are found here bordering on and extending into the California; but both above and below, these bodies are found to come together into one, being divided by a "horre" for about the depth of 85 feet. The ore from these bodies is being worked at present. Still on the 1465-foot level, and 361 feet east of the main shaft, there is a perpen-

dicular two compartment shaft, communicating with the 1,600 and 1700 foot levels. This shaft is fitted with an engine run by compressed air, and is at present working on the extension of the 1700-foot level towards the main shaft. The principal development of the 1500-foot level is a long drift running towards the California lins, and discovering the points at which the divided ore body above referred to is reunited. The next level is at 1,600 feet, and this is virtually the termination at present of the main shaft, though it is intended to continue it to the 1700-foot level, which is now reached only through the east shaft from the 1465-foot level. It is from the 1600-foot level that most of the ore yield is being taken. The ore body here is 100 feet wide and is found 80 feet farther north than at the 1500-foot level. The ore breasts here are in fine working order, the ore of fine quality and promising to continue north and south and in depth. A north drift on this level will soon connect with a winze which is coming down from the 1500-foot level. In the 1700-foot level, its extension towards the main shaft and preparations for thoroughly prospecting it are actively going on.

Much other work has been and is being done in various portions of the mine, such as cross-cutting and running drifts and sinking winzees for ventilation and for convenient communication; which, though very necessary in the system of development adopted, are not essential to a correct understanding of the general plan. The future working of the mine has been determined to be by an incline shaft which starts from the 1600 foot level and which the machinery and appliances, prepared for this purpose are capable of sinking and operating to a depth equivalent to 3,500 vertical feet. Its direction will be east in the west wall and keeping close to the lode. The incline will be worked by a set of machinery independent of that used in the main shaft, and at the 1600-foot level there will be an ore house, into which the "giraffe" used in the incline will empty itself. From thence the ore or waste will be taken, in the usual way, up the main shaft.

It is evident that the results attained and the work projected could not be accomplished without machinery of great power and capacity, and of the best construction. The first to speak of are the two hoisting engines; one having a 20 inch cylinder and 36 inch stroke, the other an 18 inch cylinder and 27 inch stroke; each provided with two reels, but operating only one rope apiece at present, as but two compartments of the shaft are being used. It is intended to put another rope on the larger engine with a reverse motion, so that one cage will descend while the other is being drawn up. A 20 horse-power engine runs all the machinery of the machine shop, drills, lathe, planers and circular saws. Still another, a 10 horse-power, operates a Baker's rotary pressure blower. A Burleigh No. 7 air compressor, capable of furnishing over a million cubic inches of air a minute, provides power for all the underground machinery, consisting of two hoisting engines on the 1,465 foot level, four or five blowers, and all the Burleigh drills that are or may be used. The compressed air is received in two large reservoirs just outside of the hoisting works building, and from there conveyed in six inch pipes to another reservoir at the 1,465 foot station, and thence distributed to where it is needed. Several reserve pieces of machinery are in readiness to be used in case of accident or any emergency. Among the rest one of Booth's compressors. All this machinery is in the main apartment of the shaft house. In an adjoining room is the 285 horse-power pumping engine, which is capable of running 14 inch pumps at a depth of 3,500 feet. There is one compartment of the shaft allotted solely to the pumping arrangements; and thus the tanks are reached at any station without interference with hoisting work.

Eight hoilers are required to furnish steam for the engines enumerated, and two more for the engines which will work on the incline. The incline machinery is also in the main building, but being independent of all the rest was reserved for separate notice. Two engines, of a combined capacity of 320 horse-power, in connection with a hydraulic of 173 pounds water to the square inch, furnish an aggregate of nearly 700 horse-power, with a capacity for work at a vertical depth of 3,500 feet. The advantage gained by this combination are principally economical; two-fifths in fuel alone being claimed. In hoisting, the pressure of the water is calculated to balance the weight of the rope and the car, leaving only the weight of its contents for the engines. In the act of lowering, the course of the water by a simple device is altered, and the weight of rope and car operate to force the water back up to the reservoir, so that none is lost but is used over and over. One engine man manages all the levers connected with the steam engines and the hydraulic. A round wire rope will be used, wound around a conical shaped drum or reel; the cone shape being necessary to regulate the speed in raising.

The application of this hydraulic engine—which is a patent of Sir Wm. Armstrong—to this auxiliary use originated with Jos. Moore, Superintendent of the Risdon Iron and Locomotive works, and J. F. Thompson, master machinist, who superintended the erection of all the works at the Ophir.

Another hydraulic engine is in operation at the ore house, which is used to elevate, to a convenient height for loading into cars, all the ore sent to the mill by rail.

The object of these letters being solely to give information of such general character as

will interest all your readers, opinions and speculations are, for the most part, not expected or desired; but it may not be amiss to record the general impression received as to the future prospects of the mine. Indeed, the value of the ore body, as far as exposed, is simply a matter of calculation, and while its extent is not determined, it has been found with increasing depth to increase steadily in bulk and in richness. The present yield—of about 180 tons—is not increased, yet only for want of milling capacity. This quantity keeps the mill fully supplied and accumulates a reserve. What is now in sight, and what is being developed in the present system of prospecting, furnish well founded expectations that the future prosperity of the Ophir may exceed that of her brightest days in the past.

It was my intention to have spoken of both the Mexican and Union Consolidated, which are worked through the Ophir shaft; but finding this letter already exceeding its prescribed limits, must wait until next week.

Virginia City, May 31st, 1876.

How Valuable Mines should be Recognized, Prospected and Worked.

[Written for the Press.]

NUMBER ONE.

Under this title we shall give a number of articles which will be entirely for the benefit of the practical miner; we will explain first the theories of the origin of mineral ledges, and their formation, then their contents as far as copper, lead, silver and gold ores are concerned, and finally give the mode of working the different classes of ores in the most simple manner, so as to enable men of small means, possessed of mining property, to work and these themselves the products of their mines.

Taking it for granted that all mineral deposits, ledges, lodes or veins are originated by volcanic eruption, the liquid mineral matter breaking its way to the surface of the earth, a conclusion as to the origin of the different formations of veins is easily derived.

True Fissure Veins.

When the above mentioned liquid mineral matter forced its way to the surface it aoted strongly against its overlying strata, thus forming a hanging wall, in many cases as smooth as if polished. It is not necessarily inferred that the pitch of such ledge should be steadily in one direction, but according to the firmness of the strata met with it might be altered and angular; there is, however, a general tendency of all metal bearing ledges to run in a northerly and easterly direction and to dip towards the east, caused no doubt by the fact that the earth revolves around its poles and from west to east.

Blind ledges merely lack the force of breaking the outer crust of the earth and are found at varying depths, but with the same description of hanging wall as fissure veins; they are, in fact, such in every detail but without croppings on the surface.

But wherever such liquid mineral matter is possessed of more than ordinary force, a certain amount of it may run over and rush into any crevice existing below, thus causing

A Wedge Shaped Mineral Deposit.

wide at the top and giving out wherever the crevice terminates. In this case the foot wall is the one acted upon and will be found smooth, while the hanging wall allows the liquid to settle and cool without offering resistance, and retains in consequence its natural broken appearance.

There is yet one formation frequently met with, caused by other than volcanic action; that is the so-called

Mineral Slide.

In a later period water or glaciers may have broken off large pieces of metal bearing ledges, carried them away long distances, together with all their surrounding strata, and deposited them elsewhere. They may offer all the appearance of fissure veins but soon terminate abruptly and upon strata of entirely different formation than the ones which they are possessed of. We shall give in our next the mode of recognizing and prospecting the above mentioned classes.

It is unquestionably a contagious disease that is known to be prevalent among a populous class of the community. GLENN'S SULPHUR SOAP will cure it. The Board of Health should order a supply of the Soap for that purpose, at public expense. Sold everywhere.

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THE BEST MACHINE IN USE FOR
SAVING SULPHURETS.No Power Required to Run it, and only a Small Stream of
Water under a Light Pressure.

ECONOMICAL,

EFFECTIVE,

DURABLE,

AND SURE IN OPERATION.

The especial attention of parties erecting new mills is called to this
Valuable Improvement.WE GUARANTEE THAT THIS MACHINE WILL SAVE NINETY PER CENT. OF ALL THE SULPHURETS
IN THE ROCK AT A MERELY NOMINAL EXPENSE. IT HAS NOW STOOD THE SEVERE
PRACTICAL TESTS OF OVER A YEAR'S WORK AT DIFFERENT MILLS
ON THIS COAST, AND HAS BEEN EMINENTLY
SUCCESSFUL IN EVERY CASE.The following letters, from practical men who have used this machine, will show to
those interested what it has accomplished:BANDERETA MINE,
Mariposa County, Feb. 7th, 1876.CHAS. SCHOFIELD, Esq.—Dear Sir: We have been using your Concentrator at our mill
about six months, and find that it saves over 90 per cent. of the sulphurets contained in the ore,
and all of the amalgam and quicksilver which escapes from the battery. The machine is simple
in construction, perfect in operation, and requiring no power to run it, is very economical. I
can confidently recommend it to all mill men as the best and cheapest Ore Concentrator now in
use.
Yours respectfully, LEVI NOEYS, Superintendent.NONPAREIL GOLD MINING CO.'S WORKS,
Deer Flat, Tuolumne County, Cal., April 12th, 1876.MR. CHARLES SCHOFIELD—Dear Sir: It is four months since the Sulphuret Concentrator
you furnished our company's mill with was first put in operation, and during the past three
months has been nearly in constant use. The men attending the Concentrator having acquired
by practice a thorough knowledge of its workings, there is nothing more to be desired; it is
perfect. A number of mill men have examined the Concentrator and its workings, and pro-
nounce it the most simple in its construction, perfect in its work, and cheaply run of any they
had seen. If you think by showing this it will assist you in disposing of your Sulphuret
Concentrators, you are at liberty so to do, as it will afford me much pleasure in having contri-
buted my little mite towards rewarding true merit. Hoping you will meet with complete success,
I remain yours truly,
JOS. J. DuPRAT, Superintendent.CON. ALABAMA M. CO.,
Tuolumne County, May 1st, 1876.C. SCHOFIELD, Esq.—Dear Sir: The Concentrating Machine recently purchased of you is
now in active operation, and we are highly pleased with it. It saves over 90 per cent. of our
sulphurets, and is run with very little expense. We could not afford to be without it, and can
safely recommend it to all mill men as the best and most economical machine in use.

M. S. MCCONNELL, Superintendent.

WASHINGTON MINE,
Mariposa County, Cal.CHAS. SCHOFIELD, Esq.—Dear Sir: Having had one of your Double Rigged Concentrators
in use now at this Mill for over a year, I take this opportunity of informing you that it is far
superior to the old English Buddie we have been using for the last four years, not only in a
saving of labor, but having a less waste of sulphurets in washing.We have the machine connected with the tail sluice, and receives the sand and water direct
from the batteries, without any handling, and it does the concentration for the 20 stamps easy,
with a loss of less than 10 per cent.Two Chinamen do all the work required—one night and the other day—working 12 hours
each, and get out about a ton each day, thus concentrating 30 tons into one, at a cost of less than
four dollars. As the cheapest, most economical and best working Concentrator I know of I can
recommend it to others without any hesitation.Yours truly, GEO. E. WEBBER, Jr.,
Superintendent Washington Mining Company.MR. SCHOFIELD—Dear Sir: Having carefully examined your Concentrator, which I have
seen in successful operation at the Francis Company's Mill and also at the Benton Mills, on
the Mariposa Estate. I have no hesitation in saying that it is the most valuable Concentrator
I have met with during my long experience as amalgamator in this country. Its manner of
catching quicksilver and amalgam is thorough and complete, and it saves the sulphurets clean
and with a loss of less than ten per cent.

Yours respectfully, L. BURDOW.

MR. C. SCHOFIELD—Sir: I have worked one of your Sulphuret Machines at the Benton
Mills about 30 days, and am satisfied it is the best machine for saving amalgam and sulphurets
ever used on the Mariposa Estate.

L. GILMAN.

The following testimonial is from the well known mining expert, PROF. J. E. CLAYTON:

CHAS. SCHOFIELD, Esq.—Dear Sir: Having followed the business of mining engineering
for upwards of 30 years, and having had in this connection much to do with regulating ma-
chinery for saving gold and concentrating sulphurets, and having in nearly every mining camp
on the Pacific Coast examined the various kinds of Ore Concentrators in use, I will say that I
have nowhere seen anything half as cheap and simple in its construction, scientific in principle
or effective in operation as your machine.

J. E. CLAYTON.

Machines can be Furnished at Short Notice. In all Cases we Furnish the
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the Proper Way of Managing It.

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Plumbers' Force Pumps.Special attention paid to Brewers', Distillers', Beer
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The Most Efficient Rock Drill in the Market.

LIGHT, STRONG and DURABLE.

No External Machinery Liable to Injury from Rough Usage, as all the Working Parts are Enclosed in the Cylinder and Valve Chest.

A TRUE SMOOTH HOLE EVERY TIME. THE MOST ECONOMICAL DRILL YET MADE.

THE WORKING PARTS OF THE DRILL ARE FEW AND SIMPLE IN ARRANGEMENT, SO THERE IS NO LIABILITY

OF INJURY. THE CLAMPS FOR HOLDING THE DRILL ON THE TRIPOD, FOR HOLDING

THE DRILL TOOL IN POSITION, AND FOR FIXING THE WEIGHTS

ON THE LEGS OF TRIPOD, ARE ALL IMPROVED

AND VERY EFFECTIVE.



The device for rotating this Drill has few parts, and can not get out of order. There is no chance for wear. The motion is positive, and never falls of action. The Drill Carriage can be turned clear round the column, and can also turn in a complete circle on the head of the clamp.

All parts subject to wear are of the Best Cast Steel, and all made to gauge and interchangeable.

This is the Lightest and Strongest Rock Drill yet invented. Being nearly all Cast Steel, it is easily handled and moved, as all superfluous metal is dispensed with.

We also call the attention of those interested to the Horizontal Air Compressor furnished with the Buckminster Drill when desired. It is Economical, Light, Easily Run and conveniently portable.

We claim that the Buckminster Drill will do as good work as any in the market, at a much less expenditure of power, and a great decrease in first cost of machinery. Drills made all the usual sizes.

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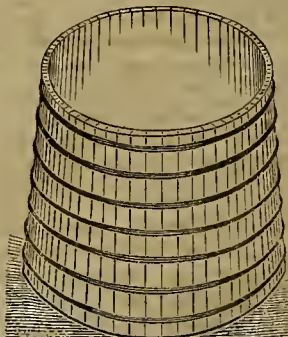
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Hoisting Engines, Diamond Pointed Rock Drills, Manufactured by M. C. BULLOCK.



WATER TANKS of any capacity, made entirely by machinery. Material the best in use; construction not excelled. Attention, dispatch, satisfaction. Ours less than elsewhere.

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\$5 to \$20 Per Day at home. Terms free. Address G. STINSON & Co., Portland, M. Dewey & Co. { 224 } Patent Agt's.

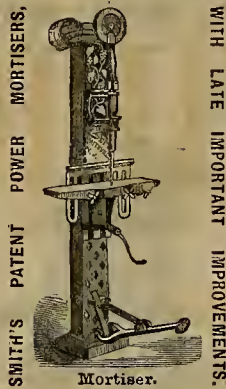
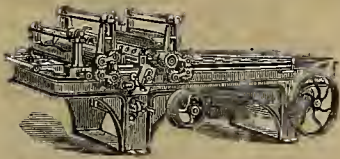
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Is gotten up from new patterns specially for this Coast. It has Cast Steel Slotted Cylinder Head, running in patent self-oiling boxes; will plane 24 inch wide and six inch thick, and tongue and groove 14 inch wide. Will make rustic and stick gutters, or heavy mouldings, etc., and is the best job machine ever built. We have always on hand these machines with or without under cutter head, also, a large assortment of Planing Mill Machinery.



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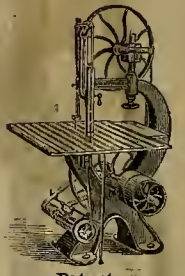
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We have four sizes of these Machines always on hand—"E," "C," "D" and "E"—to work either three or four sides. Have allotted heads, and all other improvements, and may be seen in any mill on the Coast. ⁸⁵ Prices reduced to 15 per cent. less than Eastern list. We have also, a large stock of all kinds of Planing Mill Machinery, such as Molders, Mortisers, Tenoners, Band and Jig Saws, etc. Send for our new Illustrated Catalogue. BERRY & PLACE, Selling Agents.



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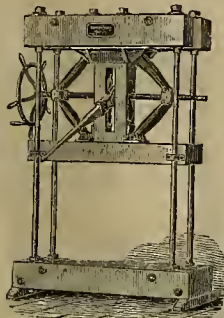
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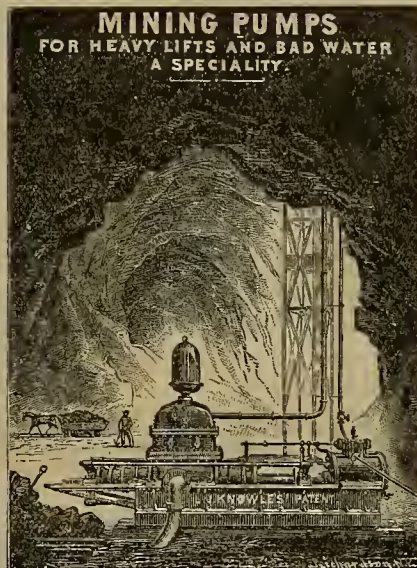
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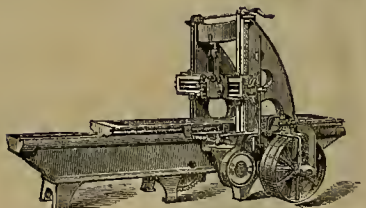
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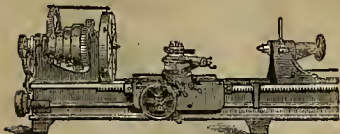
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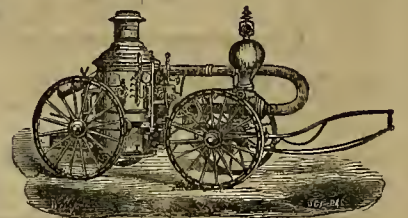
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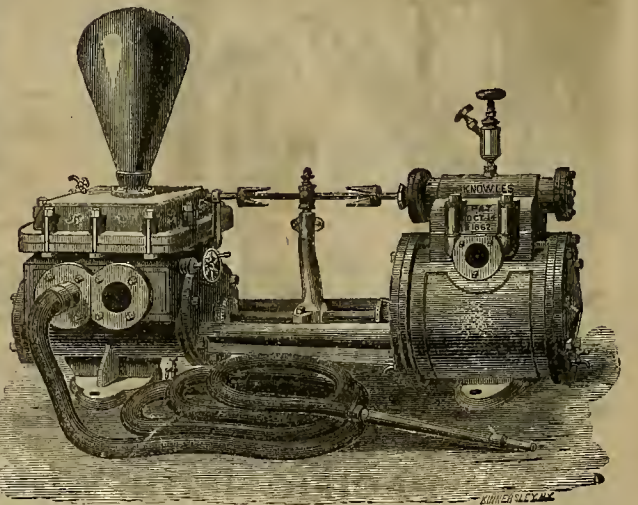
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ALL STYLES OF FANCY HEAD BOLTS.
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With Solid Heads. These
screws have excellent thread
and highly polished solid
heads. They are economical
and durable. They can be
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are not injured by the slipping
of the screw driver. For all
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Dewey & Co. { 224 } Patent Agt's.

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is now prepared to make assays of the precious
and useful metals and their ores, as well as
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desired, and is prepared to receive deposits of
Bullion for melting into bars, refining, parting
and coinage.

Special attention being paid to the treatment
of Base Bullion, and he hopes that his long res-
idence and experience in his profession will
entitle him to a reasonable portion of the busi-
ness of his friends and public generally.

MINERS write for your paper.

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Fittings at the lowest market prices.

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N. W. SPAULDING'S



PATENT DETACHABLE TOOTH SAWS.
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THE MINING AND SCIENTIFIC PRESS is one the best
papers published on this coast. It should be in the
hands of every miner and mechanic in the State. The
issue of last week contained an excellent article on the
old product of this coast.—Oroville Mercury, Jan. 28.

MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO.,
Patent Solicitors.

SAN FRANCISCO, SATURDAY, JUNE 10, 1876.

VOLUME XXIII
Number 24.

The Paul Process.

We have not spoken of late of the "Paul dry process," for the reason that we desired to obtain an illustration of the machinery, so as to show the details of working, and also because it is only now that Mr. Paul is willing to show the designs of its mechanical construction. The mill is automatic, and all crushing, pulverizing and amalgamating is done dry—water only being used for separating the amalgam and mercury from the ore and washing the debris off.

The plan of Paul's dry process mill for working gold and silver ores, is shown in the illustration on this page. By referring to the cut the details may be understood. 1 shows the position of calcining furnace; 2, the self-feeder; 3, the stamp battery; 4, dust casing; 5, elevators (these are not used when the ground admits of the battery being set on a level with the pulverizing barrel); 7, hopper for pulverized ore; 8, amalgamating barrel; 9, hopper for conveying ore to the settler; 10, first settler; 11, amalgam sse; 12, hydrostatic settler; 13, concentrator.

The ore is reduced to powder by attrition of quartz, and the amalgamation is speedy. Ore is passed into self-feeders, and that is the last of the handling. The gold contained in it will be found in the amalgam safe (which we illustrated two weeks since) all ready for retorting. The machinery is ingeniously constructed and works effectively. It is rendered perfectly automatic, so that from the moment the quartz is put into the feeder until the gold comes from

The Bonanza on Bernal Heights.

Our contemporaries have taken notice of the alleged discovery of a gold bearing ledge on Bernal heights, and did consider the matter half in earnest. The mine being so close at home and rumor spreading to the effect that active measures were taken to organize and develop the location, the expert of the MINING AND SCIENTIFIC PRESS repaired to the ground to make an examination and duly report to the public. After considerable hunting on the hills at the head of Folsom street, a hole of about 10 feet in depth was discovered, supposed to be a shaft sunk on the bonanza. But this was sufficient to give us a clear idea as to the formation of the famous lode.

Taking all facts into consideration we can readily pronounce the whole matter

A Fizzle.

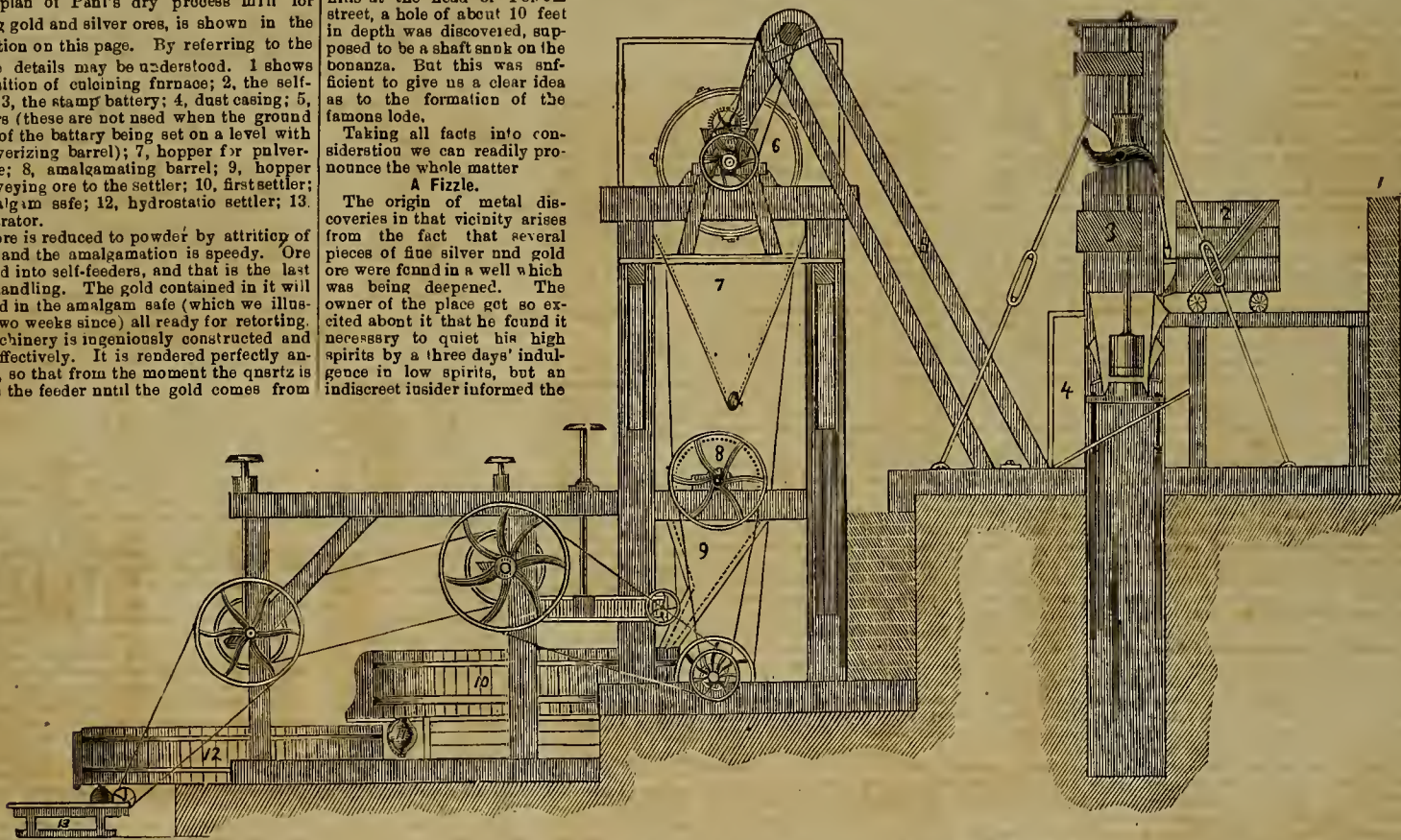
The origin of metal discoveries in that vicinity arises from the fact that several pieces of fine silver and gold ore were found in a well which was being deepened. The owner of the place got so excited about it that he found it necessary to quiet his high spirits by a three days' indulgence in low spirits, but an indiscreet insider informed the

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s SCIENTIFIC PRESS American and Foreign Patent Agency the following are worthy of mention:

WELL BORING DEVICE.—John Milton Creal, Los Angeles, Cal. The object of this invention is to provide certain improvements in apparatus for boring, and it is more especially applicable to the sinking of artesian wells. It consists of a heavy cylinder through which the

the sugar. By this mechanism the inventor does away entirely with the cumbersome arrangement of rods which must be joined and separated every time an ordinary auger is put down or withdrawn and are objectionable also on account of their weight. Their size causes an overflow of water when put down, and when drawn out if there is quicksand in the well the pressure of water to restore an equilibrium forces the sand in so as to practically stop operations. This is avoided by the use of the rope, which being only three-fourths or seven-eighths inches in diameter will not cause any overflow, and the cylinder will retain all



PLAN OF PAUL'S DRY PROCESS FOR WORKING GOLD AND SILVER ORES.

the machine in the shape of amalgam, the stuff is not handled.

Mr. Paul has given many years of study to the scientific manipulation of ores and mechanical construction of this mill, as simple as it looks. The simplicity of the mill and the cheapness with which Mr. Paul says he can work the ore must make it desirable. Only two men are necessary to run a 10-ton mill. A mill of this pattern is now being erected in this city, for the purpose of proving to those interested in mining all that Mr. Paul has claimed, and where parties can get all the ore worked that will be necessary to make the practicability of the mill acceptable. It will be open to the close inspection of the most critical. Mr. Paul's experience in these matters covers some 25 years on this coast, and he is not one to claim more than he knows he can accomplish.

The pulverizing barrel, which is one of the important features of this process, and which pulverizes quartz with quartz, and receives the ore, delivering it automatically, we will illustrate in a future number of the PRESS. Mr. Paul has just issued a pamphlet, which gives the process more in detail than we have the space for, and any of our readers who desire further information can receive one of these pamphlets by addressing Almarin B. Paul, room 20, Safe Deposit building, San Francisco.

THE CALIFORNIAN is the title of a new 32 page monthly started in this city by E. I. Johnson.

unfortunate millionaire-in-prospect that the simple reason for such ore being found there was because it was put there, and the sobering up was instantaneous. Still the story was carefully preserved by all concerned, and the rumor of vast treasures being hidden in those hills got around the whole neighborhood, and prospecting on Sundays or moonlight nights was frequently indulged in. A number of holes from six to 18 inches in depth give proof of the vigorous prosecution of the work, but to no effect.

To an illustrious foreigner, Mons. Victor Ressayre, the honor was reserved to discover the supposed lode. San Francisco and the world generally were astonished at the announcement, all the tails in the vast Chinese empire commenced to wag, several banks busted—and Bismarck retired to Varzin. But, alas, they have all recovered. The ten-foot hole gives sufficient evidence that there was but a small piece of a barren quartz ledge floated there; that passed, no more quartz would be found nor may he for—a long time to come.

TUOLUMNE REUNION ASSOCIATION.—The old residents of Tuolumne county, and their friends, will hold an annual picnic at Badger's park, Oakland, Saturday, June 17th. An inviting programme of musical and literary exercises is announced.

stem passes and carries at its lower end a boring tool. Above the weight this stem is twisted so as to form a right hand spiral for a short distance, and then a left hand spiral for another short distance. A weighted cylinder encircons this double spiral and runs at each end fits the spiral so that when the cylinder is drawn up the stem and tool will be revolved, and when it is let down the action is repeated by the other spiral so that it is continuous. Ratchets and pawls surround each nut so as to prevent the stem from rotating backwards, and pawls upon the lower weight prevent it from rotating. The upper cylinder is simply operated by a rope from the top of the well. A cylindrical bucket, open at both ends, surrounds the stem above the boring tool and thus receives the earth bored and brings it to the surface. The operation is as follows: The cylinder being alternately raised by the rope and allowed to drop back again by its weight, will turn the stem both in rising and falling with a continuous motion, by means of its contained mechanism and the right and left spirals upon the stem. The weight of the cylinder exerts a continuous pressure upon the boring tool, causing it to enter and take up the earth, which is retained in the hollow cylinder until the latter is filled, when the whole apparatus can be withdrawn and emptied by simply winding the rope upon a windlass. Simple devices prevent the cylinder from turning with

the earth or sand, so that whatever is bored out can be drawn up to the surface.

TRACE FASTENER.—William Quinlan, Mayfield, Santa Clara Co. A very common method of preventing traces from slipping over the heads of such pins as are usually secured to the ends of singletrees for vehicles of all descriptions has been to pass a thin strip of leather through an opening formed in the head of such pin. This, however, is open to the objection that the leather is extremely liable to rot and break off; and it is the object of the inventor to obviate such objectionable feature, and to provide a simple, durable and effective means whereby the traces can be easily secured in place and all liability of accident avoided. To this end the invention consists substantially in a spring catch plate, which is pivoted to a bent arm connected with the end of a singletree, and arranged to engage with the pin upon which the trace is held.

The annual meeting of the American Institute of Mining Engineers was held at Easton, Pa., on May 23d, and the following officers elected: Abram S. Hewitt, President; W. P. Blake, E. B. Cose and R. W. Raymond, Vice-Presidents; R. W. Hunt, J. S. Newberry and T. F. Witherbee, Managers; T. D. Rand, Treasurer; T. M. Drawn, Secretary.

The Trial of Agricultural Machinery at Stockton.

[J. W. RILEY in Rural Press.]

On my arrival in Stockton on Saturday, May 13th, I went to Washington square, where I found assembled a large number of farmers, to witness a trial of straw burning engines and other agricultural machinery. Among the numbers present were Mr. Ames, of the Ames engine manufacturing company, Oswego, N. Y.; Mr. Hamilton, of the firm of Baker & Hamilton, San Francisco; Mr. Rice, of Haywards, manufacturer of straw burning engines; Mr. Clark, of San Jose, agent for Mr. J. Enright, of San Jose, manufacturer of straw burning engines; Mr. B. Jackson, of Woodland, patentee of the Jackson self-feeder for threshing machines. The following named Stocktonians were on hand to exhibit and explain their respective implements: E. J. Marsters, self-feeder; Thomas Powell, electric elevator; Mr. King, straw burning attachment; Matteson & Williamson, derrick forks; H. C. Shaw plow company. The above named manufacturers, agents and patentees took a lively interest in showing off the good points and advantages of their respective wares.

King's attachment claims superiority and preference over all others on account of its adaptability to all styles and patterns of wood or coal burning engines, to which it can be fitted for about one-fourth the cost of changing to the Cornish style of boiler. The straw is fed through a tube to the fire box. The grate bars are three or four inches apart. In front of the tubes a concave plate is arranged, similar to the brick arch used in locomotive boilers. This plate, to a great extent, prevents the choking up of the tubes, and ensures a more perfect combustion of the straw. With this attachment on a Gaar, Scott & Co.'s engine, the steam gauge indicated 100 lbs. pressure to the square inch, 50 minutes after starting the fire, with two gauges cold water. For a more detailed account of the performance of this engine, the reader will refer to your advertising columns. This engine ran a burr mill grinding barley. Fire box boilers for burning straw are manufactured extensively in England for shipment to Hungary and other grain growing countries where straw is of little or no value.

The Rice engine was running a gold medal separator with E. J. Marsters' self-feeder attached. Several loads of barley were threshed, which had been hauled into town for the purpose of showing the working of this engine, self-feeder and separator.

The Enright straw burner, represented by Mr. Clark, was not on the ground, but a large engraving (framed) for convenience of showing the engine served to give any one a correct idea of the engine, in connection with Mr. C.'s explanation showing its improvements on the first ones made. The engine is a bed plate hoiler, felted and covered with galvanized iron and bands. After this exhibition I noticed three of the Enright engines on one freight train. The demand for these engines will probably exceed the supply this season.

Byron Jackson, of Woodland, proprietor of machine shop and planing mill, was on hand to show his self-feeder and elevator for threshing machines. For four years Mr. Jackson has made and sold 200 of these labor saving attachments; six of them are on the Glenn ranch, Colusa county. One of these feeders is attached to the 48-inch threshing machine "Monitor," illustrated on first page of the Rural Press some weeks back. Mr. Jackson now has over 60 orders for his feeders. He employs 26 men, and manufactures horse forks and derricks and Wm. Jackson's grain lifters, and runs a steam threshing machine. He has fitted to his portable engine a traction gear. This engine will move itself and separator and derrick wagon. This all our engines ought to do and eventually will do, though at the present time I believe there is only one other engine in the State that will do this. The next improvement is to apply King's attachment for burning straw to this engine, which will be done before threshing commences. A straw burning traction engine with windlass to hoist forks by steam, will save six horses and one man, and one cord of wood per day, and the Jackson feeder saves one man at \$4 per day.

E. J. Marsters, of Stockton, manufactures a self-regulating feeder for threshing machines. This feeder is new. It gave good satisfaction last year. The manufacturer claims to have the best feeder. They are very simple and light weight, about 175 pounds. They do not require detachment from the separator when moving, and save the labor of two men. By removing the feed board, it is secured in position without cutting away or altering the separator. It requires but little power to run it and has no complicated parts to get out of order.

Thomas Powell's electric elevator attracted much attention. This elevator is used in the harvest field to elevate grain, hay and straw from the wagon bed to the stack. The load is taken up in a center-opening net and raised by horse power with a suitable derrick. The stack can be built of great height and the tramping out of grain is avoided. The header is not delayed for want of a wagon, as a four-horse load is transferred to the stack in a few seconds. By referring to your advertising columns, the reader will get a fair idea of the elevator.

Study of American Mines and Metallurgical Works by Foreign Engineers.

The following announcement of the officials sent to the Centennial exposition has been communicated to the *Engineering and Mining Journal* through the American Institute of Mining Engineers:

Russia sends Collegienrath Prof. Nimolsy and Hofrath Prof. Jossee, Hofrath Skskoffsborg, Secretary of the Corps of Mines.

The German commission will be made of two sections, which will study separately the Eastern and Western mining regions. The Eastern section, for the study of our coal mining, will be conducted by the mine directors, Brossa from Zabrze in Upper Silesia, and Hornecke from Saarbruck; iron and lead works in the East by Bergrath Dr. Weddig; mining and furnace machinery by Oberbergrath Althaus from Breslau; transportation and the questions of trade and labor will be studied by Mine Assessor Mosler, of Berlin.

The second or Western section takes up the subjects of ore mining and metallurgy, which will be studied by Mine Director Koch, of Tarnowitz, in Upper Silesia, and Mine Assessor Richter, from Clauchal, in the Hartz.

The reports of these distinguished mining engineers and metallurgists will undoubtedly be of great interest and value.

Why does not our Government appoint commissioners to report upon mining and metallurgy as exhibited at the Centennial exposition?

An Ingenious Workman.

An Osklend mechanic has prepared to send to Philadelphia a mammoth seal of the State of California, composed of no fewer than thirty-five of the native woods of the Pacific coast. The design is novel and excellent and the workmanship elaborate and delicate. There is first the outline of the body, wheel-like in shape and four feet and four inches (in diameter and twelve inches through the hand from front to obverse side. The frontispiece, if we may term it such, is suggestive. The groupings of figures are most artistically done, and the carving of each figure, of mountain, of water, of ships, most ingenious and faultlessly executed. The prominent figure is "Minerva," in standing posture, two feet six inches in length by seven inches in width, and seven inches through, the whole, being made of white cedar. A conchont grizzly bear occupies a prominent position at the foot of the goddess. The harte is fifteen inches in length, seven and a half inches in width and four inches through his ebagg mane head. The wood used in the building of the bear is laurel. A very unique and suggestive picture is that of the miner with raised pick, board at foot, and bank of earth above. He is six inches tall; his head and shoulders are of chips of California holly; mountains of tiger wood, and sheaves of wheat of yellow pine. The carved capitals "E. U. R. E. K. A." are made of the tamar wood. The segment rim with stars is of red cedar, and the back representing the sky of sugar pine. The man's body and legs are of black gum; his pick is of pepper wood, the rocker by his side of mesquit, the shovel blades of tit-ti, the handle of willow, the dipper of myrtle, the pan of mountain mahogany, the rooks of live oak, and water of California maple. The spear handle, which the goddess Minerva holds in her hand, is made of the gray mesquit, and 17 inches tall; and the spear itself, made of aureola. The shield is very elaborately wrought from the aureola, stars of willow and stripes of elder. The scroll in the eagle's mouth is of redwood, and capitals, "WELCOME," of California orange. A handsome plate, with the figures, "1876" cut from the California huckeye, and the scrolls on the end of the plate are made of the wild cherry. There is a motto "With Freedom for All," elegantly carved from the tule wood. Around the rim the motto in capital letters is conspicuously seen, i. e., "The Great Seal of the State of California." This is made of orange wood.

The back of the wheel is scarcely less elaborate and quite as tasty as the front. The center picture is a magnificent eagle, carved from the tiger wood. It is twenty inches long, nineteen inches across the body, with wings forty five inches in dimensions. The rim is of redwood root veneer, the molding of California walnut, and the inner molding of orange wood. The motto "Liberty and Independence," is displayed conspicuously. The first word is carved from the myrtle, the second from live oak, and the word "Independence" from the myrtle. Then there is a scroll made of Spanish cedar, and the main background of sugar pine.

The pedestal on which the main seal is to stand is three feet four inches by 13 inches. Its various sections are made of mahogany and cedar, the molding of walnut, and the scroll on top of walnut.

The table on which the two other pieces are to stand are manufactured of the tumane wood. The top is of walnut. Its dimensions are four feet 11 inches by two feet four inches. The legs are ornamented with beads, flutes and leaves. There are four drawers of walnut in the table, which is a model of beauty.

The ingenious mechanic who devised and manufactured this remarkable specimen of handiwork is Charles J. Larson, one of the employees in the mills of Messrs. Burnham & Standeford. He has collected and assorted all the woods, and done all of the mechanical labor. He has spent all of the last five months in perfecting this monument of his skill and industry.—*Oakland Transcript*.

Abolishing Telegraph Poles.

In accordance with the plans adopted some time ago by the Western Union telegraph company, work was begun early yesterday morning, nearly opposite the Western Union telegraph building, preparatory to laying four underground tubes, two for electric wires and two for pneumatic carriers.

The trench which is being opened will be three feet deep, and when the tubes are laid down the wires will be drawn through. There will be but a few at the outset, but they will be gradually increased up to 125 should business require it. Two brass pipes will be laid through Broadway and Wall streets to No. 14 Broad street, and two through Maiden lane to No. 134 Pearl street, and from there to the Cotton Exchange, for pneumatic carriers. Iron pipes will be used for the wires. There was for a time some hesitation in the mind of Mr. Prescott, electrician to the Western Union telegraph company, as to the metal to be used for the pneumatic tubes. In London lead is used; in France and Germany, iron. The company has, however, decided to use brass. One of these tubes will convey messages from the main office; the other will bring the messages to it. The pipes will be perfectly smooth inside and air-tight.

The courier in which messages are inclosed is a gutta percha pouch, covered with felt, two inches in diameter, with a band of felt projecting half an inch round the end. This fits the pipe accurately, and is driven to its destination by compressed air. By the action of another exhaust the pouch is brought back. Each of the offices is supplied with two pipes, to prevent interruption and allow the passage of a continuous stream of pouches. Each pouch has a capacity for 50 messages, which are kept in place by a rubber band. The time occupied by the passage of a pouch is half a minute. The underground wires will be conducted through three iron tubes resembling common gas pipes. The manner of introducing the wires through the pipes is as follows: During the work a wire is run through each section of 400 yards. A box containing coiled wire is then drawn through the next sections of the line. The pipes have a capacity for 125 wires, but only 100 will be placed in them. In the building a new duplex pump has been placed to furnish motive power to the pouches passing through the pneumatic tubes. The whole work is under the direction of Mr. A. S. Brown, Superintendent for this division, and will be finished within a month. The President of the company says that the new system will save operating expenses and facilitate the handling of messages.—*New York Herald*.

Washing with Hard Water.

"Tids", in a recent number of the *Farm Journal*, asks what is the best way of washing clothes with hard water. There are various substances and preparations advertised, to soften water, but the very best I know of, and I have tried many, is to "break" with wood ashes, by the old way of scalding sufficient ashes and then turning ashes and water into a barrel which has been filled from the well. It is better to have it done over night before using to wash, that it may thoroughly settle, and then use care in dipping off. If I were obliged to use hard water, I would have a good barrel with a spigot near the bottom for drawing the water off, as the least of the sediment or ashes makes the clothes yellow. The quantity of ashes needed to cleanse a barrel of water can only be determined by trial, as in different soils and localities the quality of the water varies. In coal burning regions, where good wood ashes is hard to get, a washing fluid made of unsalted lime one pound, sal soda two pounds and borax one pound, will be found very good. To prepare, boil the lime in one gallon of water, the soda and borax together in another gallon, turn them together in a vessel and when settled draw off the clear fluid, and fill up with another gallon of water, which when clear, add to the first and cover, or cork in jugs for use, using just enough to soften the water. This is an excellent preparation for use, even with soft water, saving soap and rubbing, and whitening the clothes without injury.

PATENT HORSE AND CATTLE GROOMER.—During the past month Mr. N. Wilson has practically demonstrated the value and capabilities of an ingenious grooming apparatus at the agricultural hall, Islington. Briefly described, the invention consists of a brush somewhat akin to the rotary hair brush now in use in hair dressing establishments, and is operated at the extremity of a suitable spindle attached to a series of jointed rods, fitted with a new hemispherical form of joint in such a way that it is capable of being worked by an ordinary fly-wheel, which can be managed by a lad. The apparatus is also arranged to work either right or left, so that both sides of the horse can be brushed nicely and thoroughly, penetrating the coat of the animal in such a way as to effect a complete grooming, while removing all dirt and secretions without irritation or inconvenience, and imparting to the coat that glossy appearance which is held to be the true test of good grooming. The advantages of such a groomer must be apparent, for, besides performing its work so satisfactorily, much time is saved, which is a point of merit unattained by any of the old methods of brushing and curry-combing, and as there is nothing in the operation to worry or hurt the animal no difficulty is experienced, even with horses of nervous temperaments.—*Ironmonger*.

Bill to Restrict Chinese Emigration.

WASHINGTON, May 15th.—Senator Sargent introduced to-day the following important bill to restrict the emigration of Chinese to the United States:

Be it enacted, etc., That no master of any vessel owned in whole or in part by citizens of the United States, or by citizens of any foreign country, shall take on board such vessel at any port of the Chinese empire, or at any other foreign port or place whatever, any number exceeding ten Chinese passengers, whether male or female, with the intent to bring such passengers to the United States, or shall bring such passengers within the jurisdiction of the United States.

Sec 2. Whenever the master of any such vessel takes on board of the same at any foreign port or place any greater number of Chinese passengers than is prescribed in the first section of this Act, with the intent to bring such passengers within the jurisdiction of the United States, he shall be deemed guilty of misdemeanor, and shall, for each passenger so taken on board and brought within the jurisdiction of the United States exceeding the number of ten, be fined \$100, and may also be imprisoned for a term not exceeding six months.

Sec 3. The master of any vessel arriving in the United States, or any of the Territories thereof, from any foreign place whatever, at the same time that he delivers the manifest of the cargo, and if there be no cargo, then at the time of making report or entry of the vessel pursuant to law, shall, in addition to the other matters required to be reported by law, deliver and report to the Collector of the District in which such vessel shall arrive, a separate list of all Chinese passengers taken on board of his vessel at any foreign port or place. Such list shall be sworn to by the master in the same manner as directed by law in relation to the manifest of cargo, and on the refusal or neglect of the master to comply with the provisions of the section he shall incur the same penalties, disabilities and forfeitures as are provided for refusal or neglect to report and deliver manifest of cargo.

Sec 4. The amount of the several penalties imposed by the foregoing provisions, shall be a lien on the vessel violating these provisions, and such vessel shall be libeled therefor in any Circuit or District Court of the United States where such vessel shall arrive.

Sec 5. Informers shall be entitled to one-half of any penalty or fine collected under provisions of this Act, upon their information.

Sec 6. Nothing herein contained shall be held to repeal or modify any law forbidding the importation of coolies or of females for immoral purposes into the United States; provided, that no consul or consular agent of the United States residing at any port from which any vessel carrying Chinese passengers may take her departure, shall grant the certificates provided for in Section 2162 of the Revised Statutes, for more than ten Chinese passengers on any one vessel.

Sec 7. This Act shall take effect from and after the 1st of September, 1876.

SWEET YEAST.—As many housewives have trouble in this climate in keeping their yeast sweet and good, they will be glad to learn how they can at all times have good reliable yeast that will keep for weeks, and which makes good, light bread. Yeast made after the following recipe will never fail, if the directions are followed: Take a small handful of hops and boil in a quart of water for half an hour, or until the hops become sticky. Strain off the liquor and let it cool somewhat, add then a teaspoonful of sugar and two even teaspoonfuls of flour, and pour into a stone jar of pitcher and cover with a cloth. Let this stand three or four days, when it will be ready for use. When bread is to be made, peel and boil four or five medium sized potatoes, and when done mash them and add to the pulp enough of the water in which the potatoes were boiled to reduce it to a batter; add two teaspoonfuls of flour, one of sugar, and a good half tea cup of the hop mixture, mix and set as ordinary yeast. It will take six or eight hours to raise. Use as ordinary yeast. The hop liquor will make good bread; but it is best to add the potatoes, as they keep the bread from becoming too dry. This recipe is worth ten dollars to any housekeeper.—*Santa Barbara News*.

THE AMERICAN SOCIETY OF CIVIL ENGINEERS.—A circular has been issued by G. S. Greene, President, and G. Leverich, Secretary, of the American Society of Civil Engineers, in relation to certain tests of iron, steel and other metals proposed by the United States board appointed for that purpose. The society have a 400 ton testing machine, nearly finished by superior workmen, of the best materials. Also, a chemical laboratory for a comprehensive series of comparative chemical and physical analyses and tests of irons, steels, bronzes—subjecting them to a variety of stresses to ascertain their real strength so as to avoid the present excess of material, and cheaper structures and machinery, and also to make the production of machinery a matter of scientific synthesis rather than a trade secret. To carry out this system of gaining essential information that cannot be obtained in any other reliable way, considerable expense will be incurred, to meet which a small appropriation is asked of Congress—a sum that should be promptly given, as it would save the heavy charges for experimental boiler tests, etc., which, as yet, have been unsatisfactory, though they have involved large expenditures.

MECHANICAL PROGRESS.

Locomotive for Working Steep Gradients.

An English engineer, Mr. Andrew Handyside, has recently patented in England and this and several other countries a locomotive engine for drawing trains up inclines. A trial was recently made with one of these engines at Bristol, England, and the result was such as to show that the invention is one of some merit.

The engine weighed 13 tons, and to it were attached two trucks weighing together 25 tons, 14 cwt.; and one portion of the line on which the trial was made was on an incline of one in twelve. The peculiarity of the system is that the engine is coupled to the train by a steel chain or wire rope, wound round a drum mounted in the framing of the engine. The axis of this drum works horizontally in bearings fixed in the main framing of the engine, and it is rotated by gearing from a separate pair of cylinders, distinct from the usual cylinders which drive the locomotive. A drum, two feet in width and one foot in diameter, will accommodate chain enough to fulfil all the requirements of the system. On each side of the engine framing, and on each side of one or more carriages or wagons of the train, there are suspended one or more self-acting gripping struts, which, when let down on the rails by the driver or other person in charge of the train, will firmly grip the sides of the rails, and hold the engine or train stationary. On arriving at the foot of the incline, the engineer releases the hauling drum, and, without stopping the engine, runs up the gradient to the required distance. The struts are then let down on the rails; and by grasping the rails, they render the engine stationary, and the load is drawn up to the engine much after the fashion that loads are drawn up inclines at collieries. The last truck of the trial train was furnished with an automatic gripping strut, which, when the trucks commenced a retrograde movement, at once grasped the rails on each side, and held the train in its place beyond the possibility of its being moved, on informant states, even when the engine with full steam on was backed against it.

The experiments were of the most thorough description, and the invention was tested in every way. In the first place the value of the gripping strut was shown. The powerful little engine mounted the gradient without its load, and, full steam on, ran the whole length of the siding. At a signal from Mr. Handyside, the brakes were applied, and the engine was brought to a standstill in the length of a rail and a half. The contrast between the power of this brake and the ordinary hand brake, with which the engine was also supplied, was fully shown. The wagons were then attached, and the brakes on the engine and on the brake van were applied simultaneously with equally satisfactory results. This experiment was witnessed with considerable interest, as the brake question is just now occupying very much of the attention of railway men. With the continuous brake, it was pointed out that, 90 per cent. of the wheels being braked, a train is pulled up in about 900 feet with the train going at a speed of 50 miles an hour. In this case, the train pulled up in about 600 feet, and only 75 per cent. of the carriages were braked. After duly testing the brake, the method of mounting steep gradients was shown. The engine put full steam on, ran to the foot of the incline, and then, letting out the steel wire rope which coupled it to the trucks, mounted the steep alone. The gripping struts were then let down; and the engine having thus been made stationary, the trucks were hauled up to it, the automatic gripping strut coming into action, and the whole train remaining stationary. The accomplishment of this test occupied a surprisingly short time. The tracks were then lowered to show the control which the driver was able to exercise over a train for lowering purposes. The company claim that, by this invention, smaller and less powerful engines may be used on heavy gradients, and that it will allow of less cost in constructing lines, inasmuch as less cutting will be required. — *Scientific American*.

TELEGRAPH WIRES AND INSULATORS.—The wire mostly employed in England for telegraph work is of the quality of soft iron wire, known as "best best." There appear to be some ridiculous names of iron wire, as there are of plates and bars; there are best, best best, and extra best best, and charcoal wire, the best of all. Surely the makers or the merchants, or whoever gave these names to wire and other forms of manufactured iron, cannot reflect with any pleasure upon the occasions which have given rise to these pretended superlatives and super-superlatives, ridiculous as they are in every other sense than that of enabling manufacturers to gain some temporary advantage over the public and over each other. It would appear that "best" wire is not good enough for telegraph purposes; for, in testing the strength, the scale begins with "best best," and goes on to include the two higher qualities. The material from which most of the insulators employed at the present day in England are formed is brown earthenware. It does not insulate so highly as porcelain, nor can it be so perfectly glazed; but it is produced with greater uniformity of quality, and its manufacture can be more thoroughly relied upon, and it possesses the farther advantage of cheapness over porcelain, ebomite, or glass. — *Builder*.

Mechanical Puddling.

In *Harpers' Annual Record of Progress*, for 1875, we find the following: The problem of mechanical puddling attracted more attention during the past year than ever before, although the results obtained in the different manufacturing districts into which rotary puddlers have been most largely introduced are somewhat conflicting, from which it would appear that the problem of puddling by machinery has not yet been wholly solved. In certain quarters of England, and in Pittsburg in this country, the Danks furnace has given great satisfaction, and the number of furnaces has been increased. In certain other districts the experience with this system has not been so fortunate, while the Crampton system has been very successfully operated.

In England, where comparatively greater activity in the manufacture of iron during the past year prevailed than in this country, the Crampton system, in this special field, appears to have been steadily gaining in favor. In our brief allusion to the Crampton plan, in last year's *Record*, we noticed that its chief features resided in the adoption of a water jacket arrangement and the use of dust fuel; and it is very suggestive to note that in certain modified Danks furnaces, lately erected in England, the leading improvement consisted likewise in the introduction of a water jacket arrangement—approximating therefore in construction to the Crampton furnace so far as the mode of cooling by water is concerned. So far as relates to the speed of working, both systems appear to be equally good, provided the apparatus is in good condition; but in the quality of endurance under the rough usage of practice, which in this case happens to be the test of commercial success, the friends of the Crampton system lay claim to decided superiority. With regard to the relative merits of the latter system and the modified Danks furnace, just referred to, a competent authority speaks as follows: "As to what would be the relative endurance of two furnaces, each constructed on Mr. Crampton's plan, with water jacket arrangements, but one worked on the Danks system and the other with dust fuel, there are no data for actually determining; but there are certainly no reasons for believing that the results would be in favor of the former." And the same authority sums up a comparative resume of the subject in these words: "Altogether, when we consider the numerous advantages attendant on the use of fuel in the form of dust, and the general excellence of the mechanical arrangements which Mr. Crampton has designed and practically carried into effect for the utilization of such fuel, we cannot but regard the Crampton furnace as the most advanced solution of the problem of mechanical puddling." On all hands, finally, it is admitted that the ultimate success of mechanical puddling is assured, and that the puddling process of the future will be carried on in rotary furnaces capable of dealing with large charges, and worked in connection with plant capable of easily manipulating the large puddled balls produced.

KEEP OFF THE RAILWAY TRACKS.—An important and interesting opinion was recently delivered by Judge Paxson, of the Supreme court of Pennsylvania, in a suit involving the right to recover damages for injuries received by the claimant at a time he was walking upon a railway track. The decision is noticeable on account of its clear assertion of the doctrine that a railway company has a right to the exclusive use of its own tracks, except at crossings, and that any person who violates this rule thereby not only forfeits all claim to damages for injuries that may be inflicted upon himself, but commits what is in England regarded as a penal offence, and should be so considered here. The opinion very forcibly and justly says: "We hold these corporations to a strict line of responsibility whenever passengers are injured by accidents to their trains. It follows that we should be equally emphatic as to their control of their tracks. Except at crossings, where the public have a right of way, a man who steps his foot upon a railroad track does so at his peril. The company have not only the right of way, but such right is exclusive at all times and for all purposes. This is necessary, not only for the proper protection of the company's right, but also for the safety of the traveling public. It is not right that the lives of hundreds of persons should be placed in peril for the convenience of a single foolhardy man who desires to walk upon the track. In England it is a penal offence for a man to be found unlawfully upon a railroad track. It would add materially to the public safety were there a similar law here."

RUSSIAN MANUFACTURES.—The Russian edge tools differ from those of other countries in some peculiar respects. The common spade, for instance, is made chiefly of wood and simply tipped with iron; it is of small size, rounded at the edge, and has a plain carved handle. The axe is much larger than that manufactured by other nations, and is used, too, for all kinds of carpenter's work—an ax, in fact, as a plane, a hammer, and even as a saw, the last tool being rarely used by the Russian mechanic, for he can wield the axe more easily, and cut through thick logs of wood with incredible precision and rapidity. Samovars are a leading article of the Russian metal industry, these being a kind of tubular boiler, with little charcoal furnaces, and are used for making tea; the material is copper,

which is almost exclusively used among the well-to-do classes for cooking utensils, tinware, hollow cast iron vessels and pewter being but little in vogue. Horseshoes are produced by hand at the rate of some thirty million annually. Bell making is carried on with especial success, the bells being remarkable for their immense size and richness of tone. Harness fittings of European pattern are made, but only in very limited quantities, those which are used upon Russian harness being of considerably different construction.

SCIENTIFIC PROGRESS.

The Work of the United States Fish Commission.

Professor Spencer F. Baird, United States Commissioner of Fish and Fisheries, in a letter to Congress in behalf of a small appropriation for fish propagation, gives some interesting facts regarding the scale on which the work of his commission has been conducted, and the future operations of that body. He states, in order to show the extent of operations, that the number of eggs of the California salmon alone, collected during the season of 1875 at the United States establishment on the Upper Sacramento river, amounted to about 11,000,000, making a bulk of 80 bushels, and weighing, with their packing, nearly 10 tons. The work of propagation has been successfully carried on in the Potomac river, in which from 6,000,000 to 10,000,000 pounds of shad and herring are now taken during the spring months alone. There is no reason, says Professor Baird, why any stream in the United States, having direct communication with the Gulf of Mexico or either ocean, may not be made to abound to an equal degree with these and other fishes.

A portion of this year's appropriation is to be devoted to the introduction of the European carp, a species eminently calculated for the warmer waters of the country, especially the mill ponds and sluggish rivers and ditches of the South. This fish often reaches a weight of six or seven and sometimes as high as eight pounds. Its length varies from six inches to two and a half feet. The upper portion of the body is a golden olive brown, and the abdomen is a whitish yellow. Its flesh is excellent eating; and as game the fish is but little inferior to the trout. It inhabits the fresh water lakes and streams of Central and Southern Europe, whence it has been spread by man over the northern portion. It prefers quiet waters with soft and muddy bottoms, and spawns in May or June, according to locality. The food consists of larvae of aquatic insects, worms and soft plants, though the fish will eat almost any vegetable food in artificial ponds.

The carp is probably the most canning of all fishes, although it can be easily tamed. It seems to learn the danger of hooks and baits, after a few of its fellows have been captured. Even the net, which is so effective with most fish, is often useless against the ready wiles of the carp, which will sometimes bary itself in the mud as the ground line approaches, so as to allow the net to pass over it; or if the ground be too hard for such a maneuver, it will shoot boldly from the bottom, leap over the upper edge of the net, and so escape into the water beyond. The fish has also the peculiarity of living to a great age, and it is said that carp exist in French ponds over a century old. It is tenacious of life, even when food fails and when removed from the water, and if carefully packed in wet moss so as to allow a free circulation of air, it will survive for weeks. Professor Baird anticipates no difficulty in domesticating this valuable fish in American waters, since it can be multiplied at very little expense even in restricted ponds.

Geometrical Chemistry.

A writer in the *Scientific American* says: In France, our Centennial year has been honored by the discovery of a new metal, to which its Gallic discoverer, Da Bois Baudran, has given the name of gallium. But 1876 was destined to higher chemical honors at home, for it witnessed here not merely the discovery of a new element, but the revelation of a new theory of chemistry, and the evolution of a new code of laws for its working. If the expectations of their author, Prof. Henry Wurtz, shall be justified, a grand revolution in theoretical chemistry is at hand, in comparison with which that of Laurent and Gerhardt was insignificant. One thing is certain: chemistry is still but a collection of generalizations. We have no theory of chemistry, as Dr. Crum Brown recently said, although we are struggling towards it. Here Prof. Wurtz comes to the rescue, offering us a theory which promises to explain many facts heretofore imperfectly understood, to correct our so-called rational formulas, to upset our theory of types and to open new avenues of research.

Prof. Wurtz begins by demonstrating mathematically the relative diameters of molecules in solids and liquids. Hitherto molecules have always been compared in a gaseous state, but he proposes to compare them as liquids or solids, and, as far as possible, at the temperature at which ice begins to melt, or just below 32 deg. Fah. His first remarkable discovery was that the relative volumes of various simple substances, in a solid or liquid state, whether

elements or compound radicals, as found by dividing their equivalents or atomic weights, as we are wont to call them (multiplied by 1,000 to avoid fractions), by their specific gravities, were perfect cubes of whole numbers.

Now it is well known that solid, whether cubes, spheres or polyhedra, are to each other as the cubes of their diameters; hence, thought our New Jersey chemist, the cube roots of these figures represent the diameters of our molecules.

For instance, the diamond has a specific gravity of about 3.555. The atomic weight of carbon is 12; if we divide 12,000 by 3.555 we have 3,375, which is the cube of 15; hence the molecule of carbon in the diamond has a diameter of 15.

The volume occupied by a molecule of carbon when in combination is, however, not constant, being usually 8,000, or 20th. The molecular volume of hydrogen is still less constant, but generally a perfect cube.

Oxygen alone retains a constant volume, viz., 5,184 (the cube of 17.3075), and hence Prof. Wurtz takes this as his standard for all other values.

In his memoir, published in a late number of the *American Chemist*, he adduces numerous examples to prove the truth of this discovery, showing that, whatever space an element occupies in a liquid or solid, at 32 deg. Fah., that space or volume can be represented by a perfect cube, whose root, of course, is the diameter of the space, be it cube or sphere. Such, in brief, is the distinguishing feature of the first part of the new discovery. Strangely enough, this law holds good for compound radicals as well as elements.

Limits of Perception in Regard to Musical Tones.

This subject is dealt with by Prof. Preyer, of Jena, in the first of a series of original papers on physiological subjects which are to be published under his editorial supervision. He has endeavored to fix the lowest and highest limits of pitch within which musical tones can be perceived, by means of experimental methods of greater precision than any that have been hitherto employed for the purpose. The minimum limit of the normal ear was found to lie between 16 and 24 single vibrations per second; the maximum limit reached 41,000; but many persons with average powers of hearing were found to be absolutely deaf to tones of 16,000, 12,000 and even fewer vibrations. The author then proceeds to inquire into the power of discriminating relative pitch and of appreciating musical intervals. In the last section of the paper he treats of silence, defining it as a state of uniform minimum excitation of the auditory nerve fibers, and joining issue with Fechner and others who deny its claim to be regarded as a positive form of sensation at all. Fechner distinguishes between the effect of absence of light upon the eye, and that of absence of sound upon the ear; black he regards as a sensation, silence as an absence of all sensation. Preyer points out, on the contrary, that the two cases are in every way analogous, and that the auditory organ never sinks, any more than the retina, below the zero of sensation. The pressure of the fluid contents of the labyrinth, and the flow of blood through the vessels, must give rise to the sensations of which we are unconscious only because of their uniformity, their constancy and their low degree of intensity. Silence, when the attention is concentrated on the sense of hearing, is found to vary in degree, just as the blackness of the visual field, when light is excluded from the eye, has been observed to vary. But the complete absence of sensation is obviously incapable of varying. Lastly, the parallel between the auditory sense and that of vision is borne out by a study of the entoptic sensations which may be produced artificially, and which are closely analogous to well known entoptic phenomena.

ELECTRIC LIGHTING.—Experiments in electric lighting have been continued at the Northern railway station, Paris. We hear that the Northern railway company will, if these trials are satisfactory, light the arrival depot by electricity. This building encloses a space of 300,000 cubic meters. For this purpose four electric lights will be used, rather more powerful than the one used in the luggage rooms and custom house, which is employed from five o'clock till midnight. At the trials of which we speak, a Gramme machine was being tested, giving a light equal to 100 jets of gas, consuming 150 liters an hour. At the factory of MM. Sautier and Lemmonier, experiments have lately been made with the photometer and dynamometer, the results of which show that this powerful machine gives a light equal to 1,850 Carcel burners. The equivalent consumption of oil would be 71 kilogrammes an hour; of gas, 194 cubic meters (equivalent to 650 kilogrammes of coal). The cost of the electric light is about one hundredth part of that of oil. — *Moniteur Industriel Belge*.

NEW APPLICATION OF INFUSORIAL EARTH.—Boettger publishes the observation that when an alcoholic solution of any of the coal-tar colors is mixed with a sufficient quantity of infusorial earth, water added, and the mixture filtered, the liquid will run off clear, while the earth retains all the pigment. Hitherto the compounds of alumina have been used for the production of the so-called lakes, and it is quite probable that the above noted behavior of this material, which is very cheap, may find important applications in the arts.

Table of Highest and Lowest Sales in S. F. Stock Exchange.

Name of Company	1 Wk to May 15	1 Wk to May 25	1 Wk to June 1	1 Wk to June 8
Adams Hill	11 1/2	11 1/2	11 1/2	11 1/2
Advance	11 1/2	11 1/2	11 1/2	11 1/2
Alpha	65	48 1/2	50	56 1/2
Alta	3	2 1/2	3	2 1/2
American	21 1/2	21 1/2	21 1/2	21 1/2
Ames Flat	2 1/2	2 1/2	2 1/2	2 1/2
Andes	2 1/2	2 1/2	2 1/2	2 1/2
Antelope	2 1/2	2 1/2	2 1/2	2 1/2
Arctic	2 1/2	2 1/2	2 1/2	2 1/2
Baldwin	2 1/2	2 1/2	2 1/2	2 1/2
Belcher	21 1/2	19 1/2	20 1/2	20 1/2
Belt	38 1/2	51 1/2	52 1/2	53 1/2
Buckeye	45	44	45	45
Bullion	45	44	45	45
California	80 1/2	74 1/2	75 1/2	81 1/2
Challenge	53 1/2	43 1/2	45	45
Chollar	83 1/2	81 1/2	84 1/2	85 1/2
Confidence	12 1/2	12 1/2	12 1/2	12 1/2
Con Imperial	12 1/2	12 1/2	12 1/2	12 1/2
Crown Point	17 1/2	17 1/2	17 1/2	17 1/2
Crown Point	17 1/2	17 1/2	17 1/2	17 1/2
Danahy	12 1/2	12 1/2	12 1/2	12 1/2
Dayton	12 1/2	12 1/2	12 1/2	12 1/2
Eclipse	12 1/2	12 1/2	12 1/2	12 1/2
Empire	12 1/2	12 1/2	12 1/2	12 1/2
Eureka (G.V.)	11 1/2	11 1/2	11 1/2	11 1/2
Eureka Con	11 1/2	11 1/2	11 1/2	11 1/2
Exchequer	22 1/2	18 1/2	19 1/2	20 1/2
Florida	11 1/2	11 1/2	11 1/2	11 1/2
Gila	11 1/2	11 1/2	11 1/2	11 1/2
Globe Con	11 1/2	11 1/2	11 1/2	11 1/2
Golden Chariot	11 1/2	11 1/2	11 1/2	11 1/2
Goldfield	18 1/2	17 1/2	18 1/2	18 1/2
Hale & Nor.	64	54 1/2	55 1/2	55 1/2
Ida Elmore	11 1/2	11 1/2	11 1/2	11 1/2
Jefferson	12 1/2	12 1/2	12 1/2	12 1/2
Kentucky	12 1/2	12 1/2	12 1/2	12 1/2
Knickerbocker	12 1/2	12 1/2	12 1/2	12 1/2
Kosuth	12 1/2	12 1/2	12 1/2	12 1/2
Lady Bryan	12 1/2	12 1/2	12 1/2	12 1/2
Lady Wash	12 1/2	12 1/2	12 1/2	12 1/2
Leo	12 1/2	12 1/2	12 1/2	12 1/2
Leopard	12 1/2	12 1/2	12 1/2	12 1/2
Leviathan	12 1/2	12 1/2	12 1/2	12 1/2
Manhattan	12 1/2	12 1/2	12 1/2	12 1/2
Meadow Valley	12 1/2	12 1/2	12 1/2	12 1/2
Mendocino	12 1/2	12 1/2	12 1/2	12 1/2
Middle	12 1/2	12 1/2	12 1/2	12 1/2
Mint	12 1/2	12 1/2	12 1/2	12 1/2
Monitor	12 1/2	12 1/2	12 1/2	12 1/2
Monterey	12 1/2	12 1/2	12 1/2	12 1/2
New York	12 1/2	12 1/2	12 1/2	12 1/2
Niagara	12 1/2	12 1/2	12 1/2	12 1/2
North Belle	12 1/2	12 1/2	12 1/2	12 1/2
Occidental	12 1/2	12 1/2	12 1/2	12 1/2
Old Gold Hill	12 1/2	12 1/2	12 1/2	12 1/2
Old Gold Hill	12 1/2	12 1/2	12 1/2	12 1/2
Pacific	12 1/2	12 1/2	12 1/2	12 1/2
Phil Sheridan	12 1/2	12 1/2	12 1/2	12 1/2
Pioneer	12 1/2	12 1/2	12 1/2	12 1/2
Prospect	12 1/2	12 1/2	12 1/2	12 1/2
Prussian	12 1/2	12 1/2	12 1/2	12 1/2
Ryan	12 1/2	12 1/2	12 1/2	12 1/2
Rock Island	12 1/2	12 1/2	12 1/2	12 1/2
Rye Patch	12 1/2	12 1/2	12 1/2	12 1/2
Sage	12 1/2	12 1/2	12 1/2	12 1/2
Sierra Nevada	12 1/2	12 1/2	12 1/2	12 1/2
Sierra Nevada	12 1/2	12 1/2	12 1/2	12 1/2
Silver Hill	12 1/2	12 1/2	12 1/2	12 1/2
South Belle	12 1/2	12 1/2	12 1/2	12 1/2
Union Con	12 1/2	12 1/2	12 1/2	12 1/2
Union Con	12 1/2	12 1/2	12 1/2	12 1/2
Wells Fargo	12 1/2	12 1/2	12 1/2	12 1/2
Yellow Jacket	12 1/2	12 1/2	12 1/2	12 1/2

Sales at S. F. Stock Exchange.

FRIDAY, A. M., JUNE 2.	50 Chollar	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
775 Alpha	60 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
775 Best & Belcher	53 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
775 Bullion	45	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
775 California	81 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
775 Chollar	83 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
775 Con Imperial	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
775 Crown Point	17 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
775 Eureka	11 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
775 Goldfield	18 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
775 Hale & Nor.	64	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
775 Idaho	11 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
775 Jefferson	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
775 Kentucky	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
775 Knickerbocker	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
775 Kosuth	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
775 Lady Bryan	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
775 Lady Wash	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
775 Leo	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
775 Leopard	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
775 Leviathan	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
775 Manhattan	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
775 Meadow Valley	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
775 Mendocino	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
775 Middle	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
775 Mint	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
775 Monitor	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
775 Monterey	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
775 New York	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
775 Niagara	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
775 North Belle	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
775 Occidental	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
775 Old Gold Hill	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
775 Old Gold Hill	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
775 Pacific	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
775 Phil Sheridan	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
775 Pioneer	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
775 Prospect	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
775 Prussian	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
775 Ryan	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
775 Rock Island	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
775 Rye Patch	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
775 Sage	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
775 Sierra Nevada	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
775 Sierra Nevada	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
775 Silver Hill	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
775 South Belle	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
775 Union Con	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
775 Union Con	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
775 Wells Fargo	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
775 Yellow Jacket	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial

WEDNESDAY, A. M., JUNE 8.	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
355 Alpha	55 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
355 Best & Belcher	53 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
355 Bullion	45	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
355 California	81 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
355 Chollar	83 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
355 Con Imperial	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
355 Crown Point	17 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
355 Eureka	11 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
355 Goldfield	18 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
355 Hale & Nor.	64	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
355 Idaho	11 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
355 Jefferson	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
355 Kentucky	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
355 Knickerbocker	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
355 Kosuth	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
355 Lady Bryan	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
355 Lady Wash	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
355 Leo	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
355 Leopard	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
355 Leviathan	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
355 Manhattan	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
355 Meadow Valley	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
355 Mendocino	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
355 Middle	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
355 Mint	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
355 Monitor	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
355 Monterey	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
355 New York	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
355 Niagara	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
355 North Belle	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
355 Occidental	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
355 Old Gold Hill	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
355 Old Gold Hill	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
355 Pacific	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
355 Phil Sheridan	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
355 Pioneer	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
355 Prospect	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
355 Prussian	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
355 Ryan	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
355 Rock Island	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
355 Rye Patch	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
355 Sage	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
355 Sierra Nevada	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
355 Sierra Nevada	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
355 Silver Hill	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
355 South Belle	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
355 Union Con	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
355 Union Con	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
355 Wells Fargo	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial
355 Yellow Jacket	12 1/2	5000 Con Imperial	5000 Con Imperial	5000 Con Imperial

SALES OF LAST WEEK AND THIS COMPARED.

THURSDAY A. M., JUNE 9.		THURSDAY A. M., JUNE 8.	
575 Alpha	55 1/2 @ 56 1/2	155 Alpha	55 @ 55 1/2
200 Bullion	45	480 Andes	3 @ 72 1/2
515 Best & Bel.	53 1/2 @ 53 3/4	50	10 1/2
355 Belcher	53 1/2 @ 53 3/4	140 Betcha	3 @ 54 1/2
50 Chollar	81	50 Best & Belcher	53 1/2
445 California	80 1/2 @ 81	50 Confidence	70
125 Crown Point	15 1/2 @ 14 1/2	100 Caledonia	8 1/2 @ 8 3/4
120 Con Virginia	13 1/2 @ 13 3/4	140 Calico	3 @ 54 1/2
1400 Con Imperial	5 1/2 @ 5 3/4	20 Con Virginia	73 1/2 @ 74
50 do	5 1/2 @ 5 3/4	30 do	3 1/2
20 do	5 1/2 @ 5 3/4	30 do	3 1/2
30 Confidence	10 @ 10 1/2	140 Con Virginia	73 1/2 @ 74
30 Caledonia	8 1/2 @ 8 3/4	140 Con Imperial	5 1/2 @ 5 3/4
70 Exchequer	18 1/2	100 do	5 1/2 @ 5 3/4
20 do	18 1/2 @ 19	100 do	5 1/2 @ 5 3/4
70 Hale & Norcross	10 @ 10 1/2	100 do	5 1/2 @ 5 3/4
200 Julia	10 @ 10 1/2	100 do	5 1/2 @ 5 3/4
165 Justices	22 1/2 @ 21 1/2	100 do	5 1/2 @ 5 3/4
20 do	10 @ 10 1/2	100 do	5 1/2 @ 5 3/4
110 Kentucky	12 1/2	235 Exchequer	18 1/2 @ 18 1/2
640 Lady Bryan	50 @ 50 1/2 @ 51	175 G & Curry	15 @ 14 1/2
655 Mexican	2 1/2 @ 2 1/2	175 G & Nor	37 1/2
200 do	2 1/2 @ 2 1/2	40 Julia	10
300 Ophir	5 1/4 @ 5 1/2	275 Justice	22 1/2 @ 23
185 Overman	60 @ 61 1/2	65 Knickerbocker	40
175 Savage	18 1/2 @ 19 1/2	100 Lady Bryan	50 @ 50 1/2
150 Sierra Nevada	12 1/2 @ 12 1/2	150 Leviathan	10
50 Succor	62 @ 62 1/2	503 Lady Wash	21 1/2 @ 21 1/2
24 Utah	21 1/2 @ 21 1/2	393 Mexican	31 1/2 @ 31 1/2
440 Un Con	11 1/2 @ 11 1/2	100 Imperial	5 1/2 @ 5 1/2
340 Jacket	31 1/2 @ 31 1/2	100 Mint	40
		25 New York	57 1/2 @ 58
		85 Ophir	55 1/2 @ 55 1/2
		80 Overman	40
		20 Prospect	66
		40 Rock Island	17 1/2 @ 17 1/2
		154 Savage	17 1/2 @ 17 1/2
		18 Silver Hill	8 1/2 @ 8 1/2
		45 Sierra Nevada	13 1/2 @ 13 1/2
		90 Utah	20 @ 20 1/2
		390 Union Con	11 1/2 @ 11 1/2
		5 Wells Fargo	12 1/2
		10 Verde	12 1/2
		55 Yellow Jacket	3 1/2 @ 3 1/2
		250 do	1 1/2 @ 33 1/2

AFTERNOON SESSION.		AFTERNOON SESSION.	
250 Andes	23 1/2	525 Belmont	21 1/2 @ 22
525 Belmont	21 1/2 @ 22	320 Coso Con	25 @ 25
500 Caledonia	8 1/2 @ 8 3/4	500 Caledonia	8 1/2 @ 8 3/4
50 Coso Con	35	20 G Thomas	10 1/2 @ 10 1/2
55 Challenges	4 1/2	410 Goldnt Chariot	2 1/2
15 Dayton	4 1/2	75 Hinesey	55 @ 56
220 Eureka	11 1/2 @ 11 1/2	100 Imperial	5 1/2 @ 5 1/2
60 G Thomas	13 1/2 @ 13 1/2	100 Jackson	5 1/2 @ 5 1/2
245 Golden Chariot	2 1/2 @ 2 1/2	30 Julia	10
15 Globe	3 1/2	100 Jefferson	12 1/2
80 Meadow Valley	1 1/2 @ 1 1/2	80 Kentucky	40
25 Northern Belcher	12 1/2	40 Leopard	6 @ 6 1/2
150 New Coso	12 1/2	90 Meadow Valley	1 1/2
265 New York	15 @ 15 1/2	50 Meadow Valley	1 1/2
10 Osgood	5 1/2 @ 5 1/2	200 Pacific	62 @ 62 1/2
50 Picot	20 1/2	200 Prospect	62 @ 62 1/2
200 Pacific	62 @ 62 1/2	200 Panther	10
100 Prospect	62 @ 62 1/2	80 Silver Hill	8 1/2 @ 8 1/2
200 Panther	10	60 Tibo	11 1/2 @ 11 1/2
80 Silver Hill	8 1/2 @ 8 1/2	50 Wells Fargo	20
60 Tibo	11 1/2 @ 11 1/2	40 Ward	10
200 Wells Fargo	20	200 Woodville	1 1/2 @ 1 1/2
40 Ward	10		

The Mining Share Market.

The business for the week has been rather dull; no new developments were heard of and a few dollars' difference was all indulged in in the bigger stocks. Small and so called wild cats found no grabe, and the people of California street show daily more and more that a square game of faro would be just as much appreciated by them as the most promising mining stock speculation.

The only excitement has been in Imperial, Alpha and Ophi, the latter not being much of a favorite until Friday. The advance in Imperial has been the principal topic of conversation during the week. The specimens of ore at the office taken from the winze sunk from the 2000-foot level are very fine, and are really finer than the rich ore taken from the Crown Point and Belcher. The large percentage of gold is one of its best features, it being over 60 per cent. The increased demand for Imperial did not have the effect of raising Alpha as much as it did some four weeks since. The north drift having been stopped where the winze is being sunk, it left the ground north in Alpha to be prospected through what is known as the Bullion drift. This drift is running diagonally across the ledge from the west wall and is in vein matter inside the black dike some 16 feet. It strikes the ledge from the west side. Reports were circulated during the week that the ledge had been passed through to the east wall, but it is not the case, and the reports no doubt were circulated for the purpose of buying stock. There is plenty of time within the next ten days for the drift running towards Exchequer and Bullion to demonstrate whether there is any ore in the 2000-foot level of Alpha or not.

There were the usual fractional variations in Yellow Jacket, Mexican, Exchequer, Savage, California, Consolidated Virginia, Best & Belcher, Gold & Curry and Union. Sierra Nevada, unlike Savage, continued to sink till near the end of the week under its oppressive assessment. Savage is a different proposition, and between this and election day some lively moves may be looked for if the signs of the times are not off their regular beat.

There was no session of the Pacific board on Wednesday afternoon on account of its being the first anniversary of their establishment.

MECHANICS' INSTITUTE FAIR.—An election of officers was held on Monday, 5th inst., with the following result: A. S. Hellidge, Henry L. Davis, George Spaulding, James Sperry, Asa R. Wells, James B. Stetson and James Drury. All the above were members of the old board. The installation of officers will take place at the rooms of the Institute, Saturday evening, June 10th. As soon as the Board is organized active measures will be taken for the furthering of the 11th industrial fair. A fine exhibit is anticipated.

NEPLAN & YOUNG.—We are pleased to notice that Neplan & Young, No. 18 and 20 Spear street, S. F., have recovered their footing from the confusion of the late fire, and are now ready for business with a fine display of steam mining pumps for draining mines, feeding boilers or elevating water. During a recent visit we saw the fine machinery which the firm sells all set up and ready for examination. It gives us pleasure to announce that the firm is again prepared for the patronage of the public.

HAND INJURED.—John Leffer, a workman at the new planing mill of the Consolidated Virginia mining company, had the fingers of one of his hands badly mangled and cut by being caught in the planer on Monday afternoon. His attending physician, Dr. Conn, found it necessary to amputate one of the fingers, but hopes to save the others. —*Gold Hill News.*

BLACK HILLS.—Just before closing we are in receipt of a report by the Department of the Interior, of Walter P. Jenney, E. M., on the mineral wealth, climate and rainfall and natural resources of the Black hills of Dakota. It will certainly be of interest and we will give notice of its contents next week.

A Weekly List of U. S. Patents Issued to Pacific Coast Inventors.

FROM OFFICIAL REPORTS FOR THE MINING AND SOFT-FOOT PATENTS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.]

By Special Dispatch, Dated Washington, D. C., June 8th, 1876.

FOR WEEK ENDING MAY 23d, 1876.

LIFE BOATS.—James F. Cosgro, Santa Clara, Cal.

RAILWAY CARRIAGES.—Emanuel Blochman, S. F., Cal.

TRADEMARK.

BITTERA.—Winder & Shearer, S. F., Cal., (two cases.)

It has been customary in old communities to suspend pieces of stick sulphur around the necks of children as a protection against contagion in epidemics. A thorough washing with GLENN'S SULPHUR SOAP has been found a much better preventive. Sold every where.

WOODWARD'S GARDENS embraces an Aquarium, Museum, Art Gallery, Conservatories, Tropical Houses, Menagerie, Seal Ponds and Skating Rink.

General News Items.

The Sultan of Turkey has been deposed and committed suicide. His ancestor has been appointed.

A STORM of lightning struck two tonks of oil near Oil City, containing 44,000 barrels of oil; damage, \$100,000.

The American citizens of Paris have commenced a subscription to raise funds for the celebration of the Centennial Fourth of July, and for placing a marble slab, with a commemorative inscription, on the tomb of Lafayette.

Telegraphic reports give each day stronger and more numerous evidences of a state of feeling on the part of various European governments very adverse to the idea that peace can be long maintained. Russia desires to absorb Asia. She has already swept over a large portion of its territory, one might say dived over it like water. Great Britain has already control and government over a majority of the Asiatic population, excluding China. As a natural result those two governments are jealous of each other. The continuance of the Turkish Empire is thought by Great Britain to be necessary to the safety of her imperial possessions in Asia. Russia has long desired to slice off portions of Turkey and annex them. She wants free access to the Mediterranean sea. Great Britain is determined that the Dardanelles shall continue closed against her men-of-war. And to still more complicate matters, the new Sultan is a bitter enemy of the Khedive. Thus, and in many other respects, the affairs of Europe, Asia and Africa are very much mixed and tangled, and it looks as if war must result.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

California.

ALPINE.

OUR MINES.—*Chronicle*, June 3: The Advance company is pushing its work, and the very satisfactory showing of the value of its property, coupled with the rich developments in the Exchequer mine, is stimulating others to new efforts, not only in the Monitor and Silver Mountain districts, but throughout the other mining districts in the county. The great drawback mining in this county has now been overcome by the discovery of the O'Hara, Mindeff and Fryer processes for reducing rebellious ore. [A little less enthusiasm on this point would not hurt our cotemporary any.—*Eds. Press*]

THE ADVANCE.—To-night this shaft will be down about 230 feet. It is going down at the rate of at least 10 feet a week, so it will soon reach the 300 level, where they anticipate striking a heavy body of good milling ore.

AMADOR.

MONTREAL PLACER CLAIM.—*Amador Ledger*, June 3: The main channel is said to be 200 feet wide. About 20 small carloads from the 400-ft drift have been washed, and yielded at the rate of \$1.50 per carload—a remunerative return. The entire length of the tunnel is in dirt that prospects well, and will pay to hydraulic.

MARONET MINE.—The work of taking out rock commenced on this mine early in the week, and the Lincoln mill is now running to half its capacity in crushing the same.

CALAVERAS.

MINING ITEMS.—*Calaveras Chronicle*, June 3: The new steam pump lately put in the San Bruno shaft, at Mosquito, broke Thursday. We don't know what part of the pump broke, but it was necessary to send to San Francisco for castings. Good rock has been recently struck in the mine. Work is steadily progressing at the Grasshopper-sinking shaft and running levels. Splendid ore has been struck north of the shaft. Garland's mill started up the latter part of this week. Rock from the Haddock mine is to be crushed first.

GWYN MINE.—*Calaveras Citizen*, May 27: Work here progresses favorably, the bullion product being \$1,500 per day. Staking has been recommenced in order to be ready to run another level as soon as this is worked out. The news from the mine is exceedingly cheering.

COLUSA.

QUICKSILVER.—*Colusa Sun*, June 3: The report of W. R. Aldersley, the superintendent of the Abbott mine, shows: Number of days' run, 28; amount of ore reduced, 386 tons; number of flasks, 171.

CONTRA COSTA.

THE OLAYTON QUICKSILVER MINE.—*Contra Costa Gazette*, June 3d: At Olayton, on Saturday last, we saw two flasks of quicksilver which had just been brought in from the mine, the result of hand pan washing from the debris about the furnace. There is every reason to believe that work upon this mine will soon be actively resumed and prosecuted.

INYO.

DEFIANCE MINE.—*Coso News*, May 27: There are now being extracted from the mine 40 to 45 tons of ore per day, without the aid of hoisting works. These works will be put in operation next Monday, when the developments in the mine will proceed more rapidly.

GABRIEL.—The vein has been struck at the bottom of the incline shaft, which is now down about 100 feet. The face of the drift at the point of the cross-cutting is in splendid ore which assays 300 tons per ton. There is no longer any doubt as to the continuity of the ledge, and its width is now shown by the cross-cut and evidences on the surface to be 70 feet.

UNION COIN.—*Inyo Independent*, May 27: Operations on Cerro Gordo hill seem settled down to about the steady going thing in the county. Both furnaces are under constant fire, producing an average of 100 bars per each, of a grade of bullion for the market. In that place, though the ore worked is almost entirely "soft," just as it comes in the mine. The new working shaft, which is being both sunk and raised from the main tunnel level, is open to the surface from a depth of 320 feet and is now being timbered. Machinery for the hoisting works is lying on the dumps, and the necessary staking therefor is under headway.

LEE DISTRICT.—Sixteen miles north of Darwin, and nearly midway between that point and Cerro Gordo, is situated Lee district, one of the new mining localities now attracting attention in the southern portion of our county. The Cacuna mine, the most extensively worked of any in the district, belongs to the Emigrant mining company, an incorporation having J. B. Fink, Greenman and J. M. Taylor as trustees, the former acting superintendent. The company's mine, consisting of the Cactus, Valentine, Center, Philadelphia,

Capitalist, Centennial and Mountain View, are nearly all situated upon the summit of a cactus pampa, dividing the northern end of Panamint valley from the slopes toward Big Lake, the altitude of which cannot be more than 5,500 feet above the sea. The country is chiefly waste—the ledge presenting all sorts of curious shapes, lying under the black scoria cinder-piles. The Cactus seems to be an irregular body of extremely rich chloride ore, of an average width of five and one-half feet. At the date of our inspection, some three weeks or so ago, the opening in this particular mine was not deeper than 15 feet, but of a length and breadth three or four times that. Some 250 tons of ore, the poorest of which would readily work \$300 per ton, was in the dump. Of this class we have an interesting specimen showing the purest born silver, flecked with bunches of free gold. The Valentine, which is evidently a continuation of the same and showing well for the permanency of both, is a nearly upright ledge, opened by shaft and incline to a depth of 60 feet, at the bottom of which some good ore is to be seen. The Center and Philadelphia matter. The company have nearly completed a steam five-stamp mill, situated at Zacaton springs, some six miles distant, which we confidently predict will produce more bullion to the stamp—for the first few months at least—than any other mill ever erected on the coast. The company employ 20 men; have never levied an assessment, the expenses so far having been mainly defrayed by subscription to San Francisco. There is no Emigrant stock on the boards, and we understand none for sale. The other mines of the district bear the same general character, among which is the M'zeppa, a ledge producing the richest character of free chlorides, belonging to Messrs Walsh, Jordan & Watson.

NEVADA.

EUREKA.—*Foothill Tidings*, June 3: Official reports from this mine of last Saturday are to the following effect: Our clean-up for the last four days' run of 20 stamps, 12 hours per day, 14,400 ounces of amalgam. There are changes in No. 3. The Boardley claim has improved a little, showing a small ledge and a little sulphurets. No change in Eureka proper.

The Fryer works are for the present closed to the public.

PLACER.

GREEN VALLEY MINING.—*Dutch Flat Forum*, June 1: The Hidden Hill claim, under the superintendency of George Upel, cleaned up four of their boxes last week, after three weeks' washing, the result being 10 pounds of coarse gold. They are busy at present cleaning up bedrock, and we expect to hear of still larger results in a few days. This is one of the most extensive hydraulic mines in that vicinity. The Boardley claim. There are five men employed in this claim drifting; they are averaging \$8 per day to the man. Harper, Gathorpe & Co. have suspended work for the present, owing to the hard nature of their ground. They are making arrangements for 1,000 feet of iron pipe, which will give them the required amount of pressure to work their ground to good advantage. The Norway & Co. claim. They have been washing in this mine for five months; as their water is becoming scarce, they are preparing to drift. This mine has paid a large dividend this season.

TUOLUMNE.

THE SOUTHERLY MINE.—*Union Democrat*, June 3: The clean-up for the month of May in the Southerly mine resulted in a showing of 1,200 ounces, aggregating in coin \$20,400. The pans and concentrators have not been cleaned, and about three tons of sulphurets yet remain to be worked. It is thought that the sulphurets will yield about \$50 per ton. This is a most encouraging showing, and will do much to revive the quartz mining interests of the county.

BIG CLEAN-UP IN THE SOUTHERLY MINE.—*Tuolumne Independent*, June 3: The run this month was about 15 tons of ore per day, yielding over 1,200 ounces—at \$17 per ounce, \$20,400 gold. This amount was taken from the batteries only; the dies and pans not being cleaned up, is not included. Neither does this include the sulphurets saved in Schofield's sulphurets concentrator. In 26 days 10 tons of sulphurets were saved, which the superintendent averaged, and will go \$350 per ton, making \$3,500 for the month; besides this, \$126 in gold amalgam, escaping from the battery, was caught in the first hopper of the concentrator, which had it not been for the splendid machine, would have gone into the tailing race.

THE FORD LODE.—The Ford lode, on Bald mountain, formerly owned by Gorham & Wilson, has been sold to San Francisco capitalists for \$3,100. The new company propose to put on a large hydraulic and wash the entire mountain down. The old Ford mine has yielded hundreds of thousands of dollars, and there is no good reason why it should not do so again. The last work paid \$10 per day in the pan.

Arizona.

LOCAL MINING NEWS.—*Arizona Citizen*, May 20: Our letter from the Glob's district, written from Rambozcamp on May 1st, says: Nothing particularly new has occurred since our last report. The prospecting and more solid work in the way of developing leads already located, seem to be the order of the day. The Rescue shaft is progressing finely and looking better than ever. The Pinalia now down 95 feet, and a contract has been made during the past week for 50 feet more.

This mine has carried a very rich vein of ore from the surface. The Emigrant company will soon be at work with their stamms, which are nearly finished, and they have enough ore already exposed and only their dump to keep them busy a long time. The Meteor company's shaft measured 90 feet last Saturday, and the ore vein constantly widening and looking remarkably well. The Alice company have struck coarse gold in their shaft and are driving business harder than ever. The Richmond company have not done much lately; they are waiting for machinery and tools, which the owners have now gone to San Francisco to purchase. The Sherman is looking as well as ever and the owners are now sinking the third shaft.

PROB MINE.—*Arizona Miner*, May 26: The Agna Fria smelter has run through six tons of second class ore from the Prob mine, and on Saturday they brought in 1,718 ounces of refined silver bullion as a result.

Colorado.

FRYER PROCESS.—*Boulder News*, June 2: A representative of the Fryer process company is on the way to Colorado to introduce the process here. We are told that Mr. Charles E. Sherman, formerly of this town, is studying the process in California, and intends to introduce it here, if it proves an unqualified success.

GRANT COUNTY.—*Colorado Springs Gazette*, May 27: The mines of this county are being more extensively worked than ever before and with greater profit. In a short time every available mill will be in full operation, and some have been enlarged to meet the demand upon them. Upwards of 800 stamps will be employed through the summer. The year thus far has indicated a gold yield of \$2,500,000 for the county in 1876.

PAY ROCK.—*Colorado Miner*, May 27: This immense true fissure vein, situated on Sherman mountain, is undergoing active development under the efficient management of Mr. Thomas Ellis. From the level of the Silver Lake mine, a ledge of ore has been traced and sunk, from the bottom of which a cross-cut has been run north and south a distance of near 100 feet without finding either wall. Ore of good quality and quantity is to be found in all its different workings.

Idaho.

GOLDEN ORARIOT.—*Idaho Avalanche*, June 3: Work is progressing favorably in this mine and continued hope exists as to the prospective propitious results. Over 1,000 tons of ore are now lying at the mine and

the work of hauling it to the mill for crushing will commence in a few days. The roads are being put in shape for hauling and it is expected that the Golden Orariot mill will commence crushing rock next week. J. O. Hill has "struck it rich" in his Golden Age claim below Bonville. He had some of the rock assayed recently and it showed up \$650 to the ton, and according to all accounts there is a abundance of it.

NEW PLACER DIGGINGS.—*Idaho Statesman*, May 30: Placer diggings which are thought to be quite extensive have been discovered on Snake creek in Alturas county. The diggings as far as prospected pay from \$5 to \$7 per hand.

Montana.

A RICO VEIN.—*Helena Independent*, May 25: The recently discovered Nelly Grant lode, in Yankton district, near the head of Lump gulch, about fifteen miles from town, is turning out a magnificent bonanza. An experienced miner examined the lode yesterday and pronounces it among the finest in the Territory. About fifty tons of ore are on the dump. Unfortunately work on it has been stopped in consequence of litigation, and it may be some time before it is resumed. The width of the ore in the vein is said to be eight feet—good gleba.

TWO COW CREEK NUGGETS.—Yesterday and the day previous something over four thousand dollars in gold dust was purchased by the banks, being pretty equally divided between Messrs. Horn-bell & Bro. and the First National. The dust came mainly from Indian and Crow creeks and Last Chance gulch. From Crow creek were two large nuggets of a very fine quality of gold.

Utah.

UTAH MINES.—*Salt Lake Tribune*, June 2: The cars, dumps and emelters at West Jordan and Sandy are crowded with ore. The Grizzly mine is shipping nine thousand sacks of ore daily.

Nevada.

EUREKA DISTRICT.

HADLINO ORE.—*Eureka Sentinel*, May 30: Trains were started yesterday on the Eureka Consolidated railroad, for the hauling of ore from the mines to the furnaces. We understand the smelting works will be started up by the first of the month.

SPANISH BELT DISTRICT.

THE COUNTY INMATE.—*Eureka Sentinel*, May 30: A correspondent from Spanish Belt district writes: I am more satisfied than ever that we have a large body of ore in the present level, but the capping shows we are only on the top of the ledge. We have started a winze at the end of the north drift, the ore in which improves in width and richness as we go deeper. We have also started stoping on the hanging wall, at the end of the north drift, and, contrary to our expectations, we are getting out a large amount of rich ore.

WHITE PINE DISTRICT.

GOOD MILLING.—*White Pine News*, June 3: The Eberhardt mill started up on the 6th of May, and up to the 1st of June had only lost 17 minutes in stoppages. During that time it averaged 52½ tons daily through No. 50 screens. Perley Rowell says he would like to hear from any 30-stamp mill that has done more work.

PROMISING MINES.—A correspondent of the *New York Engineering and Mining Journal*, writing from San Francisco, has the following to say of one of the White Pine mining districts: The mine of Ward district, 65 miles northeast of White Pine, Nevada, an attracting considerable attention. The Paymaster lode has been opened to the depth of 160 feet, and shows 10 to 12 feet of good pay ore. All the working expenses have been met during the past year by shipping selected ore to this city, a distance of 900 miles by rail and 100 by wagon. There are large amounts of low grade ore in the mine, and the advent of a regular customer, the Ward district mines are sure to be well known all over the land.

BULLION.—The Eberhardt company, at White Pine, have 40 large bars of bullion on hand.

RAYMOND & ELIX.—No new work to report on this mine. The prospect work on the 8th, 9th, 10th and 11th levels continues to be pushed with good success. The extraction of ore continues at the rate of 200 tons averaging from 70 to 75 tons daily. The company mill at Bullionville is now running to its full capacity, 30 stamps, an account of an accumulation of ore. The Nevada Central trains are kept running steadily for the purpose of supplying the mill. No change in the stroke of the pump at the mine, it continuing to work with regularity. The first-class ore in this mine has general appearance of the mine continues favorable.

MEADOW VALLEY.—The machinery for the hoisting works of this mine is arriving very fast, and is being shipped from Eureka by fast teams as soon as the cars land it there. The tinning of the roof is nearly completed, the building presenting a very imposing appearance. The miners continue busily at work on the 1200-ft level with fair success. The regular employees are busy sinking a winze and doing prospect work.

ALPS.—Continue extracting daily 15 tons of ore from the mine, which assays and averages in working about the same. Work on the various levels continues as usual without any variation. The white quartz vein, containing free gold, continues to yield well; some parts of this ore are placed with a gangue of iron mineral, by which the full value of both grades of mineral are enabled to be extracted. The general appearance of the mine continues to look well.

ALPS MILL.—This mill for the past week has been running altogether on ore from the Alps mine and from Toquerville. Ten stamps are kept going for ore from the Alps mine and five for the Toquerville mine. The ore from Toquerville has generally worked well. Two lots arrived yesterday morning at the mill from that town, belonging to Ferris and Cochran; the battery was immediately started to work on them.

ANTILLAS.—Sinking on the main shaft of this mine progressed very well during the past week; the ground is so hard that the contractors made a prospecting shaft during the week. The work is being pushed rapidly. Considerable change has taken place in the formation, and prospects are fair.

PROB.—The work of sinking on the main shaft below 1000-ft level is progressing rapidly, the depth having been extended 10 feet during the week. The level from the 1000-ft station is being pushed forward rapidly in hope that a good body of ore may be struck at that depth, of which there is every indication. T. R. Butler, the superintendent of this mine, arrived from San Francisco yesterday.

AMERICAN FLAG.—Prospecting in the upper levels is going on with the usual force of men. These levels have a very encouraging look, presenting a prospect of a very fine body of ore in a short time. The contractors have not commenced yet to sink the 100 feet on the main shaft. They start to work on the 1st of June.

WASHOE DISTRICT.

GOUTIN & CURRY.—*Gold Hill News*, June 1: The new carpenter shop is finished, and the erection of the new pumping machinery is being pressed ahead with great energy. The repairs to the shaft are making steady progress. A new air machine for ventilating the mine is about being erected at the mouth of the old lower tunnel. The machine, instead of drawing air into the mine, is intended to draw the hot air, by means of suction, out of the mine, and thereby create a strong, healthy current of air from one portion of the mine to another. Experts in such matters look upon the new invention as a great improvement on the old process of ventilation.

BLOCKION.—The northeast drift on the 2000-ft level of the Imperial shaft is steadily advancing, the face in ledge material. It cannot be long now before the main ledge will be reached, although the drift will have some distance yet to run to reach the ore vein encountered in the north drift of the Imperial mine. The up-

raise from the 1700-ft level is making good progress; there is a slight seepage of water in the face of the raise.

YELLOW JACKET.—Sinking the north winze on the 1600-ft level is making excellent progress. It is now down 38 feet. Sinking the east winze below the level of cross-cut No. 3, on the same level, is going steadily forward, the bottom still in porphyry and quartz, mixed with streaks and spots of ore. It is now down 41 feet. East cross cut No. 2, on the 1910-ft level, is steadily advancing toward the ore vein. Cross-cut No. 1, from the bottom of the south winze on the same level, is also being advanced steadily.

SURETUNNEL.—Very good progress has been made since the last report. The enlargement of the main tunnel to regulation size is completed, allowing the small locomotives procured some time ago to be used to excellent advantage. Total length of tunnel, 13,311 feet.

BALE & NORCROSS.—The work on the pumping machinery at the surface is steadily advancing, every place where there is room for a workman being filled, and the whole being pressed toward completion with all the force possible. While the surface work is being done, enlarged bob and tank pits are being made at the proper intervals in the shaft, and the old pump columns are being hoisted to the surface ready to put the new ones in their place at the very earliest day possible.

NORTH CARSON.—Good progress is being made laying the pipes to convey the requisite supply of water from the flume of the Virginia and Gold Hill water company, and as soon as that is got through, which will be in about a week, the new hoisting works will be started up in good style. Meanwhile work in the mine is resumed and a new working shaft has already been put down to the depth of nearly 100 feet.

BELCHER.—Daily yield, 440 tons of ore. There are no changes to report of any of the ore-producing levels, nor can there be much until the new pumping machinery is completed and the water drained from the 1600-ft level.

LADY WASHINGTON.—Shaft continues making excellent progress downward, and the vein matter constantly improves, showing more quartz and the regular white ore Comstock ledge material as further depth is attained.

MONUMENTAL.—The shaft is down 165 feet, the bottom in good blasting ground. The sinking is making good progress.

IMPERIAL.—The prospects of opening up a fine paying body of ore on the 900-ft level are looking better. The north winze on that level, of which we have heretofore made mention, is to-day down 40 feet, the full size, 10 feet in width and eight feet in height, in ore that gives average assays of \$200 to \$300 per ton. The north drift on this level is being steadily advanced to the northward to connect with the Alpha drift. This drift, in order to make the connection for air at the earliest moment, is bearing more to the left, having left the ore body to the right in its course. It will have but a short distance to go to reach the Yellow Jacket on the 1940-ft level.

JUSTICE.—Daily yield, 30 tons of ore, which is being crushed at the Sherman and Excelsior mills. The ore stops on the 600-ft level and the opening up of the 40-ft level are all showing splendidly and promise a large yield of good ore. The north drift on the 800-ft level has penetrated a fine body of white, lively quartz of a very encouraging character. The north drift on the 1000-ft level a few days since tapped a strong flow of water, which has checked work in that quarter until it is drained.

CONSOLIDATED VIRGINIA.—Daily yield, 550 tons of ore, keeping the mills all running up to their full working capacity. The reports to the 1500-ft station, and the shaft below that point are completed. The east drift on the 1600-ft level running to connect with the drift from the C & C shaft is making steady progress. The drift running west from the 1500-ft station of the C & C shaft during the past week has been advanced 52 feet or seven and a half per day, a rate of speed that has hardly been excelled on the line of the Comstock. The north drift on the 1700-ft level is in a distance of 305 feet, running east of and parallel with the ore vein. The heat in this drift is so intense that but very slow progress is made.

OPHIR.—Daily yield, 180 tons of ore. There are no particular changes to note of the ore breasts or stops on either the 1500 or 1600-ft levels. The mine is showing well at all points. The north drift on the 1600-ft level is steadily advancing toward the ore vein. Sinking the main incline below the 1600-ft level is being carried forward at a very rapid rate of speed. The incline and upraise have something less than 100 feet to run to connect with each other, and when finished will place the shaft in the finest possible working condition down to the 1700-ft level.

CONDOR.—Daily yield, 350 tons of ore, keeping the mills running up to their full crushing capacities. The ore breasts are still showing as richly as ever, and the mine is opening up splendidly at all points. Air connections have now been made with the Ophir mine on the 1300, 1400, 1500 and 1600-ft levels, which, taken in connection with the ventilation afforded by the Consolidated Virginia on the south, gives the best circulation of air that it is possible to obtain. The hullion production for the month of May will probably not fall much short of \$1,750,000.

ALABAMA.—This mine comprises the northern portion of the Lady Bryan ledge, that mine having been recently divided into three claims, to be known as the Lady Bryan, Alabama and Tahoe. The company have just commenced work in good earnest on a fine three-compartment shaft, situated east of their ledge, and distant about 200 feet from the north and east of the Lady Bryan shaft. The prospects of this mine are excellent, as the ledge has already been followed to the south line by the north drift on the 380-ft level of the Lady Bryan.

JULIA.—The main west drift on the 1600-ft level has passed through the belt of hard rock recently encountered, and the face is now in much softer ground. The south drift on the same level is still in ledge material of a splendid character. On the 1300-ft level the main southwest drift is going slowly forward, the heat created by the boiling water being so intense as to considerably impede the rate of speed. The flow of water is gradually decreasing.

SILVER HILL.—Sinking the main incline is making fine progress, notwithstanding the rock is somewhat hard. The flow of water remains much the same as for some time past.

BROOKS.—The shaft has been sunk during the past week 15 feet, making a total depth of 113 feet. At that point what appeared to be the hanging wall of the ledge was cut, and a flow of water so strong encountered as to drive the miners from the shaft and stop all work. The present machinery is evidently inadequate to drain the water.

CHOLLAR.—Daily yield, 110 tons of ore, the assay value of which is \$32 per ton. Sinking the main incline is going ahead at the rate of 15 feet per week. No change in the east cross-cut on the 1350-ft level. Sinking the new combination shaft is making the usual fair rate of speed. The erection of the hoisting and pumping machinery is steadily advancing.

COSMOPOLITAN.—Face of main adit tunnel still in good ore, and pushing ahead toward the north line of the claim. The upraise above this level is fast nearing the surface, being 217 feet in height, and having only 29 feet further to go. A large amount of good pay ore has been developed by this winze.

OVERMAN.—Daily yield, 35 tons of ore. This ore is taken from the 900-ft level, which shows no change whatever of note. The station at the 1200-ft level of the shaft has been completed and a drift started for the ledge at that point.

ROCK ISLAND.—The quartz in the face of the main west drift on the 800-ft level is still showing considerable improvement in both looks and quality. The north drift on that level is steadily advancing, the face also in quartz. No changes in any of the prospecting

drifts on the 650-ft level, except in the ongoing south, which is showing a fine character of quartz.

GLASGOW.—The north winze below the 300-ft level, now being sunk on the ore body recently discovered, has encountered a flow of water so strong as to completely obstruct the progress of the work. It is the intention to immediately resume the sinking of the Combination shaft of the Amazon and Glasgow, to open another level and drain the flow of water at that point.

TABOE.—A combination shaft has been started directly on the dividing line between the Taboe and Lady Bryan claims. Each company is to pay half the expenses and own an equal share in the shaft.

BEST & BELCHER.—There is nothing doing in the mine at present except the making of some repairs to the incline winze from the 1500 to the 1700-ft levels, and nothing more can be done until the repairs to the Gould & Curry shaft are completed and the new pumping machinery is in good working order.

PROSPECT.—The shaft is down 239 feet, the bottom in good sinking ground. The new steam pump was set at work during the first part of the week, and is handling the water in good style.

ALTA.—The erection of the new pumping and hoisting machinery is making rapid headway. The foundations are getting well under way, and much of the machinery is ready to place in position ready for use.

SUPERIOR.—The grading for the hoisting works is completed, the machinery arrived and in position, and in the course of a day or so steam will be turned on and utilized in the further development of the mine. Work in the shaft will be resumed forthwith.

MEXICAN.—The chamber for the winze on the west side of the north drift on the 1455-ft level is completed. The shaft is now being sunk in the face of the drift, which is now being steadily advanced to the northward, as heretofore following the wall of the ore vein.

TWIN PEAKS.—The fine ore development at the 75-ft level shows better and better as further sought into. The formation thus far shows one of the regular ore features of the Comstock, and of the white ledge matter texture found at much greater depths.

WARD.—The shaft is now down 110 feet, the bottom in good sinking ground. The new steam machinery was started up yesterday and was found to work with the utmost perfection. Sinking the shaft can now be forwarded at a much more rapid rate of progress.

MINT.—Sinking the shaft is going steadily forward, the bottom still in soft ledge material. The prospect of the Mint are steadily growing more favorable and encouraging.

VIVIAN.—The ore stops are yielding the usual amount of good milling ore. The flow of water at the bottom of the main incline is steadily decreasing. As soon as the water is drained sinking the incline will be resumed for the purpose of opening a new level.

DAYTON.—Sinking the shaft is going rapidly forward. Driving the prospecting drifts on the 500-ft level, both north and south, is going forward as usual, without any valuable or important changes to report.

SAVAGE.—The pump tanks and bob pits in the shaft are completed, and the surface work on the foundations and machinery is being driven ahead with all the rapidity consistent with the perfection of the work.

UTAH.—Sinking the shaft is going ahead as usual without change of any kind whatever. Another pump lift has just been put in at the 650-ft level.

AMAZON.—The water tanks at the 300-ft level are flushed, and the pumps will commence to take the water from that point this afternoon. Sinking the shaft will be resumed at once, for the purpose of opening a new level.

UNION CONS.—The north drift on the 1300-ft level is steadily advancing, the face still in quartz and ledge material of favorable character.

KOSKUTZ.—The water has been drained, and now men are at work in every part of the mine, the same as before the flood. It will not take long now to reach the vein, when some lively developments may well be looked for.

NORTH COS. VIRGINIA.—Sinking the shaft is making excellent progress, the bottom still in soft ledge material. The flow of water is again increasing. Putting in the foundations for the new pumping machinery is going steadily forward.

NEVADA.—Sinking the main shaft is going ahead at a fair rate of progress. The prospecting drifts on the 1500, 1250 and 1000-ft levels are steadily advancing without any change worthy of note at any point.

ORIGINAL COMSTOCK.—The face of the tunnel has cut into good ore indications, and the bottom of the shaft is in softer rock than at last report. Something good in the way of paying ore is liable to be encountered very shortly.

NIAGARA POINT.—The south drift on the 1700-ft level is steadily advancing, without a change of any kind to record. The same may be said of the east cross-cut on the 1600-ft level.

LADY BRYAN.—The excavations and stonework for the foundations of the new machinery are going steadily forward, the work being pressed with all the vigor possible.

EMERALD AND AMERICAN FLAT.—Sinking the main incline is going ahead as usual.

EAST OVERMAN.—The quartz in the shaft shows improvement in proportion as depth is attained, giving a better showing for concentration into a large ore body, and a better assay.

PICTOR.—The station in the north drift being cut for the winze is nearly completed, and sinking the adit west winze will be commenced about day after tomorrow.

WEST BELCHER.—West drift is now in over 300 feet in fair working ground. The northwest is in 240 feet, still in low grade ore, which is improving some in assays.

PHIL SHERIDAN.—Sinking the shaft is making excellent headway, the bottom in soft, easy working ground, and no water whatever to interfere. It is now down 168 feet.

KNICKERBOCKER.—Excellent progress continues to be made sinking the shaft, the rock working favorably and water not impeding the work.

NEVADA.—Face of drift in softer and more favorable material. More streaks of quartz and low grade ore and less of the hard porphyry.

NIAGARA.—Sinking the main incline shaft is making good progress, the bottom still in soft ledge material. It is now down 313 feet.

CALEDONIA.—The work in this mine is still confined to sinking the main shaft, which is making grand progress. The flow of water is still strong.

SOUTH COS. VIRGINIA.—Some very good ore is being developed in the mine. All they have to do is to show pay more than the sinking of the shaft.

ORIGINAL GOLD HILL.—The retimbering of the shaft is completed at last, and sinking deeper for a new level is to be resumed forthwith.

BALTIMORE CONSOLIDATED.—The rock in the face of the drift continues getting a little softer, with other indications of approaching the ledge.

NIAGARA.—Sinking the shaft is being pushed ahead with the usual vigor. No change worthy of note.

NEW YORK CONSOLIDATED.—Work is progressing at all points with the usual vigor.

DANEY.—The work of putting in the water tanks at the 400-ft level is making steady progress.

LEVITAN.—The drift at the 600-ft level is now in 125 feet, with the face in hard rock.

MOORE.—Sinking the shaft is making good progress; otherwise there is no change.

SENATOR.—Sinking deeper is going forward at a lively rate, with excellent prospects.

COLUMBIA.—The enlargement of the shaft is rapidly approaching completion.

ROUGH & READY.—The adverse developments in the shaft still continue.

(Continued on Page 380.)

THE ENGINEER.

Straightening the Course of the Danube River.

The Danube River, through its subdivision into a large number of small branches, formerly produced, at the northeastern limit of the Austrian capital, an archipelago of islets. These were covered with beautiful groves, and to the people of Vienna, for over two centuries, the locality was a favored pleasure ground. Of late years, and especially since the woods have been cut down, the separate streams have dried or become marshes, and, in consequence, the salubrity of a portion of the city has been seriously impaired. Navigation also, always active on the river, has been, through the same cause, impeded, and despite the facilities offered to vessels by the canal which traverses the city, the necessity of engineering operations to improve and deepen the river has long been evident. The rapid extension of the northern faubourgs of the city has resulted in showing the need to be urgent, since severe and almost periodical inundations have caused large damage in the built up portions.

As early as 1810, the subject of the required improvements was agitated, but it was not until 1850 that any definite steps were taken toward beginning the enterprise. These, however, took the form of suggestions and projects but led to no practical results, and thus the matter lay in abeyance until, in 1862, a flood occurred, which submerged all the northern faubourgs, and carried great suffering into a population of over 100,000 souls. A new commission was then appointed to take prompt measures, and two years later this body seriously set to work to consider the large number of plans submitted to them. The following programme was finally decided upon:

1. To regulate the course of the Danube from the fields of Kuebelan, at the mouth of the canal, to Fischamend.
2. Extension of the project of straightening and improving above and below these limits.
3. Improvement of the section of the river, and of its accessory streams.
4. Defence of Vienna, by improved construction of new banks.
5. Deepening of the river-bed and feeding of the canal, so as to allow constant navigation.
6. Establishment of large loading quays and a winter harbor.
7. Construction of suitable accommodations for the reception of travelers, troops and their munitions of war.
8. Construction of docks, storehouses and basins, destined to transform Vienna into a great center of navigation, and to facilitate the transshipment of merchandise.
9. Establishment of quays over a distance of 4,700 meters, thus bringing the same and also the new river-bed nearer to the city.
10. Suitable arrangements for the construction of a central station for the railroads terminating at Vienna.
11. Construction of bridges and roads and of railroads on the Danube, with regard to the needs of navigation.

This vast programme was in principle accepted, but the mode of execution gave rise to long and vexed discussions, in which many engineers, Austrian and foreign, took part. Some advocated simply the improvement of the natural river-bed, while others maintained that an entirely new bed was necessary. The latter project was finally adopted, and the State, the province, and the city, the three parties interested in the rapid prosecution of the work, made arrangements to meet the estimated expense of 24,000,000 florins (about \$9,600,000).

A new commission was formed in March, 1869, charged with carrying out the details of the operation, and labor was at once begun, under the auspices of the French contractors, MM. Castor, Courreux and Hersent.

The new bed, 15 kilometers in length, commences at Nussdorf, above Vienna, and terminates below, at the village of Kaiser Eberdof.

It follows a slightly curved course, the convexity being turned toward the city, to which it is much nearer than was the natural bed. The entrance of the canal has been greatly improved, and provided with a lock which allows of its being closed during winter, and protects the city against the invasion of ice at the period of the breaking up of the same. The section of the new bed is divided into two parts; the minor bed, which ordinarily receives the greater portion of the water, is 285 meters long, and is from 3 to 3.5 meters in depth below mean level, or zero of the scale. The major bed, intended as a channel for surplus water, adds to the first a breadth of 515 meters, and its depth is two meters only below the mean level.

On the left bank there is an insubmersible dike elevated 6.3 meters above the mean level. On the right bank, a vast platform is made by the material dredged from the bed. This platform, completely sheltered from inundations, is designed to receive important constructions. The works to be executed were divided into the following:

	CUBIC METERS.
Earth excavations.....	6,557,000
Dredging.....	7,524,000
Masonry.....	207,000
Earthwork of slopes and foundations.....	448,800
Old foundations and piling removed.....	285,800
Fascine work.....	27,000

It was, besides, necessary to construct the lock at the head of the canal. A portion of the

excavation, about half, was executed by the shoveling into carts and barrows, but the balance was done by the excavator. This powerful machine was composed of a 20-horse power steam engine, which actuated a chain of hockets carried on a frame. The movement of the chain was such that the empty hockets descended from above the frame, while the full ones rose below. On reaching the emptying point, the vessels were discharged by automatic mechanism. The whole apparatus was mounted on a carriage which ran upon three rails; and a second steam engine, of four-horse power, served to move it from place to place. The excavated material, on leaving the hockets, fell into a conduit which led it to transport wagons running on a second and parallel railroad. The entire machinery, which had already been employed at the Suez canal excavation by the inventor, M. Courreux, gave at Vienna excellent results, both in point of economy and rapidity of work. The machinery employed during the entire operations included an immense amount of material. There were four excavators, nine dredgers, 18 locomotives, 397 wagons, 160 transport boats, besides steam cranes, stone breakers, towage vessels, etc., the mere care of which necessitated the construction of five huge workshops, besides extended barracks and hospitals for the large force of workmen.

A New Building Stone.

At a recent meeting of the English Society of Arts, Mr. W. Eassie, C. E., read a paper on the onyx deposits near the City of Mexico. Mr. Eassie said that some months ago he became acquainted with the product referred to, and examinations of it brought him to the conclusion that there had been unearthed for the use of succeeding generations a material which had never been eclipsed in point of natural magnificence. The people of ancient Rome, who were the predatory explorers of old, did not seem to have ever encountered so rich a material as the one before the meeting; and it would doubtless have remained practically unknown to Europe for another age had not the French expedition to Mexico, in support of the martyred Maximilian, taken in its wake the English railway contractor and his "navvy," and permitted its wholesale transport to England. Onyx was a chalcidonic variety of agate, arranged in flat horizontal planes of light, clear brown and opaque white. The deposits in question, however, were not formed in the cavities of trap rocks and the like, and was, therefore, neither onyx, chalcidony, agate, jasper, nor carnelian. It was rather an onyx-like marble, and really deserved a scientific name to itself. The applicability of this material, in following out the decorative faculty which imbedded man as he rose from the primitive conditions of life, would be seen at a glance. But its value as affording a new art material would be best understood by noticing the immense distances from which the ancients, during the early and more historical times, imported this very substance. Its application to the fine arts had not hitherto been very extended, owing to its recent introduction to Europe. Amongst the minor articles into which it had been manufactured, however, might be mentioned bowls, vases, stands of all kinds, handles of doors, etc., lamps and toilet ornaments. The future, however, of this new material would be seen, he verily believed, in the largest edifices of the country, in our mansions and in our clubs. After enumerating a few of the functions out of many in architecture which such a material as onyx might well perform, Mr. Eassie, in conclusion, to quote his own words, said that "the true position of this beautiful stranger amongst us is to lighten the duller charms of our own natural materials, and to relieve us from the abominable iteration of marble slabs here, there and everywhere—pillars of granite to the right of you, pillars to the left of you, and tiled walls and floors, upstairs and downstairs, and in my lady's chamber."

Moving Cleopatra's Needle.

Mr. Arthur Arnold has revived General Alexander's proposal to transport this famous obelisk to England and erect it on the Thames embankment, or some other suitable site, as an ornament to the metropolis. In a letter to the chief editor, Mr. Arnold expresses a high opinion of the beauty, condition and interest of the monolith. The hieroglyphics are still distinct, and although the edges of the carving and the angles of the monument itself are somewhat rounded, there is no important fracture discernible. The desirability of removing it must depend upon whether its value and interest are equal to the cost of removal; and as that is estimated at only £4,000 or £5,000, even if the authorities should hold back, the acquisition might be made by private subscription. Capt. Methuen, the senior captain and commodore of the Pacific and Oriental company, whom Mr. Arnold has consulted, is of opinion that the obelisk could be safely conveyed to London in an iron vessel not exceeding 400 tons builders' measurement, which he proposes should be constructed here, sent in pieces to Alexandria and put together in a space to be excavated below where the "needle" now lies, it having been first slung from girders, after which the short channel to the river could be easily cut, and the barge with its contents towed to England.—Iron.

GOOD HEALTH.

Mental Dyspepsia.

Concerning the real value of acquirement as a matter of discipline, authorities are not agreed. No doubt the mind may be strengthened by training, as the physical digestion and bodily health are improved by exercise. But with too many persons this discipline is the chip in the porridge that does little harm and no good. It is a serious question whether the men and women who load their minds with the juiceless roots and remnants of the dead languages and literature exclusively, are not in the condition of the fabled frog who swallowed the shot he could not digest, and which would not let him leap when he wanted to.

Brain exercise increases the development of the brain and stimulates its digestive power. But while this exercise is being taken, the physiological requisites of its healthy action must also be supplied. Some increment of knowledge must remain, or the student will become a mere literary pugilist, and not a producer.

Six weeks ago a girl of thirteen came to my clinic for relief from a distressing and intractable headache, which for some months had come on every morning and continued until two o'clock in the afternoon. The pain was severe, and her expression gave evidence of martyrdom. I said: "Do you go to school?" She answered "Yes." "For how long a time have you been to school?" "Three years." "How many studies have you?" "Eight." The case was one of mental dyspepsia, induced by over-feeding and cramming of the mind. And no wonder she was ill. If aight dishes were thrust upon the stomach, in season, and out of season, whether the appetite craved them or not, month after month, what would be the consequence?

This amount of mental pabulum was absorbed, but not assimilated. The poor girl had a load on her mind that was indigestible and alien to her faculties.

The brain revolted against such treatment, and her periodical headache was a sort of flagging the train, a signal of danger ahead. Of course the remedy was to take her from school and place her on a more sensible bill of fare. She was cured in two weeks.

In this matter of feeding the intellect, and of contributing to our mental growth, I know of no better rule than to obey the maxim which commands one to "stop while the appetite is good." If we read or study too much, or too many subjects or authors, the attention flags, the interest is gone, and then the mind does not seize upon thought factors with avidity. What clogs the appetite will clog the digestion. A loss of relish is a sign of depletion. There is a time to stop as well as a time to begin this brain work.—*Herald of Health.*

The Effect of Worrying.

Worry is defined in our dictionaries as a state of undue solicitude, anxiety, trouble. Shakespeare says that worry is

"A hell-bound that doth hunt us all to death;
A dog that hath his teeth before his eyes
To worry lambs and lap their gentle blood."

Shakespeare's picture is graphic, and one almost sees the monster before him. He personifies and makes it a creature visible to our senses, and all we have to do to escape his clutches is to run away or take our tomahawk to him. But, notwithstanding Shakespeare's graphic poetical statement, worry is not a creature at all, but simply an abnormal action of the mind to which we commonly attach very little importance; and yet which, if persisted in for any length of time, possesses elements of danger that will produce disastrous effects on the health and happiness of the individual. Worry is not a cheap and easy form of mental action, but an expensive one. The mind does not run smoothly, but with friction, heating the nervous machinery and destroying its substance. Worry is a nervous strain, a load of care and anxiety, which is too much. It comes on in times of mental weakness, when the person is tired, worn out, exhausted. Worry is more dangerous than overeating. Yea, it may be even more dangerous than drinking, bad as that is. It breaks down the body and mind. Worry is also useless. It is foolish. It is wrong. And yet most people will do it. Worry is a symptom of mental un-soundness. It does itself. The will cannot control it. It will not stop when ordered. It keeps on day and night often. It prevents sleep. It destroys appetite. It spoils digestion. It takes laughing away, and puts sighing in its place. The man always in a worry never sits down to the table with a heart full of thanksgiving. He never laughs or tells a funny story. His face is long. His heart is sad. His head is hot, and his feet and hands cold. He is not healthy. A perfectly healthy person never worries. He must begin to break down first. The nervous must first begin to tremble. Then worrying comes easy.

In these times, when the business of the country is depressed, there is far too much worrying. It don't do any good; but it does do much harm.—*M. L. Holbrook.*

DIER.—Say the vegetarians, 100 acres of good land will support a greater amount of human life, if planted to wheat, corn or potatoes, or products directly consumed by man, than if laid out in pasture or planted with vegetables designed to feed cattle. This may be true, but

all land is not cultivable to such crops as man feeds on, there being much land unfit for tillage that may be good pasture. Under the vegetarian regime, such land would furnish nothing directly for the food of man: so of forest and moor—game would cease. Vegetarians reject the products of the sea: milk, butter, cheese, beef, pork, mutton, poultry, fish, etc., are all rejected by the strict vegetarian. A mixed diet utilizes the products of the sea, the moor, the forest and grazing lands, as well as the products of tillage land.

Is Medicine a Science?

It is a nice question, in many cases, which has done the more hurt, the disease or the remedy; whether, for instance, the child's health suffer more from the intestinal parasites which vex him or from the destructive purgatives employed as anthelmintics; whether the cancer or the knife produces death more speedily; whether calomel or quinine be not utterly much such friends to the sick man as *Le Fontaine's* good-natured bear was to the gardener, whose mouth he crushed while trying to brush the flies off as he slept. It is an equally nice question to determine whether there ever really does occur a critical period in any disease, when the direct action of actual medicine, *per se*, can turn back the wavering life from the jaws of death to the flowery meads of re-established health; or, granting the possibility of such a rare occurrence, do we not run too great a risk, as a rule, to be able to profit by it? These are nice questions, as I have called them; nor does the present condition of medicine entitle us to expect to see them answered. For these reasons, among many others, medicine cannot be called a science.

It must not be supposed, however, that the doctor's office is to become a sinecure because his drugs are voted rubbish and his methods false. On the contrary, we shall need him quite as much and his advice will be more valuable to us than ever. He will not have it in his power to do harm, and consequently can give his undivided energies to the pursuit of good. It shall be his office to teach us the fallacy of physis. He shall present to our minds in all its horrid array the atrocious enormity of medicine as once it was practised, and so shall save many a poor sufferer amongst us from unconscious suicide. He shall be our perpetual beacon-light against the iron-bound, immitigable loadstone rock of quackery, where so many fair keels lie ntimely wrecked. In fine, he shall become to us the counterpart of that invaluable member of another profession, known as the chamber lawyer—a quiet man, of skill and experience, who abounds with all the wisdom and unction of pertinent counsel, and who never takes his client into court, where he bound to lose, no matter how his case is decided.—*Edward Spencer, in "The Atlantic" for May.*

USEFUL INFORMATION.

Fixing Pencil Lines and Colors on Drawings.

W. E. Debenham describes a method of fixing powder and other colors after they are applied: "I immerse the drawing in or flow over it a solution of freshly prepared moist gluten in alcohol, the alcohol to be at a strength of about 70 or 80 per cent., or a solution of gelatine or metagelatin or kindred substance (the word gelatine will be used hereafter to include kindred substances), in water, with as much alcohol added as the solution will bear without precipitating the gelatine. If the solution be hot, it will bear a large addition of alcohol. It is necessary that the solution be very alcoholic, or the colors may run, as they would in an ordinary aqueous solution. The gelatine coating may be rendered insoluble by treatment with tannin or chrome alum; the chrome alum is either added to the gelatine solution itself, or applied separately, and afterwards exposed to light.

"To prepare a photograph or drawing that color may adhere, I apply either of the alcoholic solutions already mentioned, or a solution of glycerine or sugar, or a mixture of any of these, and this preparative liquid should contain 50 per cent. or more of alcohol, in order that it may penetrate evenly. If the work can be colored before being mounted, as in the case of a photograph to be enameled, I apply the preparative liquid to the back of the paper. The alcohol makes it penetrate to the front, and the color is taken in a very even and fine manner.

"The fixing solutions are also applicable to water color, pencil and crayon drawings, and I prefer to employ gluten solution as an aqueous solution of gelatine, if desired, as an additional coat, or for the purpose of attaching it to the collodionized glass in enameling. The fixing solution itself may also be used for this latter purpose, and the coloring or touching is not to be disturbed. When it is required that the gluten solution should contain more gluten than the alcohol will take up, I evaporate rapidly, but not to precipitation, a portion of the solution, and mix with the remainder."

To whiten lace, iron it slightly, and sew it up in a linen bag; let the bag remain for 24 hours in pure olive oil. Then boil the bag in soap and water for 15 minutes, rinse in warm water, and then dip into water containing a slight proportion of starch. Take the lace from the bag and stretch it out to dry.

"Alloy" and "Amalgam."

Science often makes a wrong use of words. When we want to know the reason for a broad meaning that any word bears, we seek the root. Words in science are so often at variance with their derivation as to fail at first sight or hearing to convey a hint of their intended meaning.

When we get the derivation of a word we have its literal or restricted sense; from this we can ascertain to what degree the broad or popular meaning is justified. See how variously the word alloy is used.

Chemists use the word "alloy," to any mixture of metals, minus mercury; but, if mercury be one of the parts, then the result is an "amalgam."

In coinage, to alloy is to mix an inferior with a superior metal.

A recognized author on metallurgical science says: "The body formed by the union or combination of two or more metals with each other is termed an 'alloy' and if one of the constituent metals be mercury, the resulting substance is known as 'amalgam.'"

Webster—"Alloy, *v. t.* To mix one metal with another; to reduce or deteriorate by mixture;—*n.*, a baser metal mixed with a finer, or a mixture of metals; that which reduces or deteriorates.

The root: "Alloyer," French to "mix." O perhaps from the Latin "*aligo*," to join, to bind.

This science gives alloy a broader meaning than is given to it by the lexicographer, and one that we like better. Still, in its every use there is a more strict adherence to its literal meaning than we always find. Richard Grant White—proprietor of the English language—might be prevented from frequent convulsions were there no greater torsional subjections of derivation than making any mixture to mean only a mixture of an inferior metal with a superior.

In "alloy," we intend to abandon Webster and the coiners, and to accept the chemists and any mixture of metals that is minus mercury. In this, we accept the popular usage and are supported by Guizot: "When the meaning of a word, on the other hand, is determined by science, this determination, the work of one individual, or a small number of individuals, takes place under the influence of some particular fact which has struck upon their mind. Thus scientific definitions are, in general, much less accurate, much less true at bottom, than the popular meanings of the terms."—*American Manufacturer.*

CHARCOAL FOR GUNPOWDER.—Dogwood (*Rhamnus frangula*), which is used for gunpowder charcoal, is supplied in bundles of long slender rods. The bundles are about six feet long, and should be thirty inches in girth at one foot from the thick end, and diminish about four inches in girth at the upper end. The wood must be perfectly free from bark, and clean. Great stress is always laid on the cleanness of the wood used for conversion into charcoal at Waltham abbey; any traces of bark adhering to it constitute an impurity, and would condemn a supply sent in by a contractor. The specifications imposed on contractors provide that the wood shall be cut in the spring of the year. If this has been done when the sap is rising, the bark is easily removed, and the wood is left perfectly clean; but wood cut later in the year, or in winter, is perfectly as good, only in this case the removal of the bark is a much more difficult matter. To separate it the wood must be boiled, or if that is impracticable, the whole of the bark must be shaved off with a knife or spokeshave. Both boiled and shaved have been used at Waltham abbey, but the great objection to both is that they do not keep so well when stacked as the spring-cut wood, which goes to decay much faster.

FLOWER POTS.—We learn from the *Hamburger Gartenzeitung* that the fabrication of flower pots from a mixture of cowdung and earth is now extensively practiced in Germany, 16,000 being used last year in one establishment. For forcing they are highly recommended, though they will not bear plunging in a hot-bed; and they are admirably adapted for nursery work, for plants raised in pots and afterwards turned out, in this case pot and all. Even standing dry, the roots of plants will penetrate the sides of the pot, and extract some nourishment from them. They are made by machinery, and one man can make from 700 to 900, or even 1,000, in 10 working hours. There are machines for two sizes, two inches by two (price \$2), and two and three-quarter inches broad by two and one quarter high (price \$2.50).

LIQUID GLUE.—One part phosphoric acid, specific gravity 1.120, diluted with two parts water, is nearly neutralized with ammonium carbonate, one part of water added, and then, in a porcelain vessel, sufficient glue dissolved in the liquid to obtain a sirupy consistence. It must be kept in well closed bottles. The addition of glycerine or sugar would cause the glue to gelatinize.

SMALL SEEDS IN A POUND.—The number of seeds of wheat in one pound is 10,500; the number of seeds in one pound of barley is 15,400; the number of seeds in one pound of oats, 20,000; the number of seeds in one pound of rye, 23,000; the number of seeds in one pound of buckwheat, 25,000; the number of seeds in one pound of red clover, 249,600; the number of seeds in one pound of white clover, 686,400.

FRAUDS IN SILKS.—The debasement of silks by foreign admixture, if we may infer from the comments of journals devoted to textile interests, has of late reached such a height as to promise shortly to rival that of a class of cotton goods which have added largely to the notoriety, if not to the fame, of one of the manufacturing centers of England. A writer to one of the French journals shows that the weighting of black silks—which began with the modest aim of making up for the loss sustained in ungumming—is now carried to the extent of 100, 200 and 300 per cent. This increase of weight is effected by treatment with salts of iron and astrinents, salts of tin and cyanides. The balk is augmented proportionately to this weight. The same writer points out very clearly the evils attending this excessive adulteration. The chemical and physical properties of the silk thus treated are materially modified. What is sold as silk is, in reality, a mere agglomeration of heterogeneous matters devoid of cohesion, held together temporarily by a small portion of silk. The strength and elasticity of the fiber are likewise reduced. From being in its natural state one of the most stable of substances, and but slightly combustible, in its adulterated state it burns like tinder if touched by a flame. It is likewise affirmed to be liable to undergo spontaneous decomposition, and to absorb gases with the evolution of heat which sometimes leads to actual combustion. The adulterated silk when burning scarcely gives off the characteristics odor of animal matter.

INDELIBLE INK.—Two-fifths of a pound of tartaric acid dissolved in 61 cubic inches of hot water; in one-half of the solution dissolve one-fifth pound oily aniline; add the other half, and then one-fifth pound chloride of potassium. Allow the solution to cool and subside until next day; filter from the bitartrate, and bring the liquid to the density of seven degs. B. Thicken sufficiently with gum arabic, and add to each cubic inch one-twenty-fifth of a pound of copper sulphate, dissolved in a little water. This ink may be at once used for printing muslin and other fabrics, upon which the black color will be perfectly developed by bleaching liquids. Chlorate of copper is also used for writing upon zinc signs and labels exposed to the weather.

SERIOUS ENGINEERING MISCALCULATION.—No blundering that has been heard of in the railroad world since some of the earliest English contracts for construction, approaches in magnitude, says the *Pall Mall Gazette*, the mistake that has been made about the cost of the St. Gothard tunnel and the lines connected with it. The company which has undertaken this great work, the completion of which was promised for 1880, started with a subscribed capital of 34,000,000 francs in shares, and 68,000,000 francs raised by debentures, together with an international subvention of 85,000,000 francs, of which Italy was to contribute more than half, while the German and Swiss governments were to be equally responsible for the remainder. Thus the whole estimated cost of the enterprise, 187,000,000 francs, was provided for, and the works were begun with a confident assurance of speedy progress. A few months ago, however, some doubts arose as to the efficiency of the direction and the soundness of the estimates. A new "director" was appointed, whose inquiries resulted in the conclusion that the execution of the plan in its integrity would involve an expenditure of nearly 300,000,000 francs. The Board of Administration will meet at Lucerne to consider the state of affairs; but it is difficult to see what course can be suggested for raising the new capital required.

ANTIMONY.—We take from the *Iron Age* the following note: "There are two antimony of note in England, Cookson's brand being the best one on this side, the other brand being that of Hall's. They rank about equal. These brands at all times command the top of the market here, and they furnish us about nine-tenths of the entire quantity we consume. Our consumption may be put down as amounting to 3,000 tons annually. Any supply above this quantity would be in excess, unless the consumption increased in proportion, for which there is no prospect at present. The ores of the United States are reduced to star metal, chiefly in Nevada, where there are several smelting works; those in other localities as yet amount to very little. As for the domestic article, it has not yet attained the perfection of the English antimony, hence a good deal of our ore is shipped to England, since we are as yet unable to extract the metal from it economically enough to make it pay, notwithstanding the duty which protects us."

A MONUMENT TO BESSEMER.—Mr. Jacob Reese, of Pittsburg, proposes that a monument be erected to Henry Bessemer, which shall be constructed as follows: "Firm in the foundations of the ages, let us build on Catalan lumps a mammoth base of charcoal metal and mark it Hogge—and on it place a cheaper cast of raw aol iron in memory of Dad Dudley and, higher still, a Darby coke iron block, capped with Roebuck's porous metal, and from thence upward to the heavens project a cone of a better, cheaper, purer metal, marked in spectroscopic lines of gold to Bessemer. And while we view this mighty work, from rugged base to shining apex, let us not forget the path they trod, the difficulties which they encountered, and the necessity of the intervening age for the pending process. And around this monument of glory let us pile with willing hands dephosphorized puddle balls in such design that all may read with pleasure the name of Henry Cort."



W. B. EWER.....SENIOR EDITOR.

DEWEY & CO., Publishers.

A. T. DEWEY, ORO. H. STRONG,
W. B. EWER, JNO. L. BOONEOffice, No. 224 Sansome St., S. E. Corner
of California St., San Francisco.

Subscription and Advertising Rates:

ADVERTISING RATES—1 week, 1 month, 3 months, 1 year.			
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Prompt Subscriptions.

We wish to thank those subscribers who send in their renewals to the Press promptly as regularly as the year comes round. It saves us much expense in commissions for collections and renewals. May we not request more of our good patrons to do so!

THE ORIGINAL ARTICLES in this paper are mostly in solid type, giving in our columns one-third more reading than is contained in ordinary leaded matter.

Our latest forms go to press on Thursday evening.

San Francisco:

Saturday Morning, June 10, 1876.

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NEW ADVERTISEMENTS.

Cook's Patent Automatic Boiler Feeder and Regulator, Pacific Iron Works, S. F.; Mariposa Land and Mining Company—Sale.

A NEW PHASE IN GOLD MINING.—Since the discovery of gold in taloo-slate a few months ago and the active development of a mine of that description in El Dorado county by the Old Hickory gold mining company, a great interest in that peculiar formation has been displayed by our miners, and we will therefore give a short description of the material and its constituents.

Taloo-slate, or the elaty formation of steatite, is of primary period and generally found in large ledges and deposits in the slate range. It is ordinarily called soapstone and consists of silica 62.6, magnesia 32.5, water 4.9. It is perfectly fire-proof and of the same class as asbestos, and considering that its hardness is only two, to seven, of quartz, we dare say that the stamping or rather grinding of it can be done very easily. The company now developing the first mine of that description on this coast have 22 feet of a ledge, the assays of which run from \$50 to \$200 per ton, and we are credibly informed that the ore, on account of its softness, will work by pan amalgamation with alkali, for \$2.00 per ton. The sulphurates contained in the ore assay \$329 per ton and constitute about five per cent. As the ledge is traceable for miles we may shortly look for interesting developments in that quarter.

NEW PUBLICATIONS.—Through courtesy of Messrs. Banoroff & Co. we are in receipt of the following new works:—"Bridge and Tunnel Centers," by John B. McMaster; Nostrand, publisher, New York. "Notes on the Treatment of Mercury in Northern California," by T. Egleston; Sherman & Co., publishers, Philadelphia.

Some of the Mines of El Dorado County.

[By our own Correspondent.—No. 2.]

Ten or 12 miles east of Placerville is Pleasant Valley. To say that it is appropriately named is a sufficient description of the village and the beauties of its surroundings.

There is an excellent public school under the charge of Mr. Geo. F. Mack; a mile above is the El Dorado door factory, owned by Messrs. Wilson Bros., of your city, where doors, sash and blinds of all kinds are manufactured in large quantity. The doors are clamped up by a steam power endless screw clamp, a late invention, I understand, of Mr. H. O. Hooper, of San Francisco. The doors are passed through a diagonal planer, giving one uniform surface to them within a few moments, and afterwards polished by means of Smith's patented elbow machine.

Last year the factory turned out 8,000 pairs of blinds, 24,000 pairs of sash and 40,000 doors, giving employment to about 60 men. About 1,700,000 feet of lumber was used, the chief supply being obtained from the

Baltic Mill,

Six miles above Sly Park, owned by Mr. Louis Lepetit, who cut last year over 2,000,000 feet, principally of sugar pine, and who intends this year to saw about half a million more. His mill gives employment, directly and indirectly, to 10 large teams and not less than 40 men. Mr. L. is now building a wooden track railway from his mill to Sly Park, a distance of six miles, at a cost of perhaps \$4,000 per mile, for the purpose of increasing the supply of lumber and lessening the expense of getting it out for the market.

In the upper portion of the county there is A Very Large Business Done

In the way of getting lumber, many mills running and employing a very considerable amount of labor. Mr. Cutler at Sly Park informs me that he cut last year at his mill about 850,000 feet.

Messrs J. & J. Blair, of Placerville, are perhaps doing the largest business in this line. They have three mills which can cut 50,000 feet per day. From Sly Park, a very beautiful little valley and fine summer resort, I crossed by a blind trail over lofty ridges and down into deep ravines, over several forks of the Cosumnes, about eight miles to Grizzly Flat. Let no stranger to the country attempt to thread that labyrinth. I should have been lost but for the kindness of a good Samaritan found on the way. This is the home of the rattlesnake; a nest of upwards of 70 was recently found here. I kept a sharp eye out for them, but saw none.

Some Quartz Veins.

Two miles north of Grizzly Flat a small quartz vein, varying from 4 inches to 14 inches in width, was visited; owned and worked by Mr. Adam Branthover for the past two years. There is a four stamp mill at the mine run by a burdy-gurdy wheel 750 feet pressure. The ledge is tapped by a 200-foot tunnel to the depth of 100 feet.

The ore has paid from \$10 to \$18 per ton, and would in all probability, (judging from the character of the rock and the manner in which it prospects by hand mortar and pans), have reached \$30 or \$40 per ton if all the proper appliances for saving the gold in the ore and sulphurates had been used.

Soon reached the works of the Eagle mill and mining company, situated within one mile of the Flat. The ledge is in a granite formation, under the superintendence of Mr. John Tregloan, an experienced miner, and well known in Storey county, Nevada.

Your correspondent was sorely disappointed to find that he was absent in San Francisco. He had expected to obtain from him much reliable information, as he was an acquaintance of years long ago numbered with the past. His faithful young foreman creditably furnished the necessary information.

The ledge will average from five to six feet in width. Main shaft 240 feet, tunnel 475 feet, running along the ledge at least 400 feet, reaching a depth from surface of 140 feet. Much good ore has been taken out of the mine in the past. It had lain idle several years, and operations were commenced again last December. The company are now running a prospecting tunnel, with the view of striking the chimneys found in the old tunnel, 100 feet deeper. In the meantime they are crushing rock from the upper tunnel at Mr. Morey's 5-stamp mill, which pays from \$8 to \$18 per ton. The company contemplate building a mill at an early day. The quartz looked well and the prospects for the company are very flattering.

Almost within sight of the Eagle, is the Mt. Pleasant quartz mine, owned by Mr. O. D. Lambard. It has been worked steadily for the last 18 months. The tunnel, 370 feet in length, intersects the vein, (which is not that point 11 feet in width), at a depth of 130 feet from the surface. The average width of ledge is six feet. Drifts have been run north and south 120 feet, and the ore pays from \$20 to \$40 per ton. The 10-stamp mill below the mine is kept pounding away by day and night, run by water burdy gurdy wheel, pressure 340 feet. Eighteen men are employed. Mr. Wm. Teague, the gentlemanly superintendent, to whom I am indebted for many of the facts in reference to this valuable mine, said that he had worked it for a period of six years, from 1868 to 1874, had sunk a shaft 400 feet, and during that time had done

much prospecting at a cost of about \$60,000. Rich ore has at last been struck, and the mine is yielding a good harvest in return for the time, labor and money previously spent. The sulphurates are worth \$400 per ton.

Free gold is plainly visible in much of the ore, without the aid of spectacles. It bids fair to prove one of the best paying mines in the State. May it long continue to pour forth its treasures!

Now, my dear reader, I am going to divulge a little secret, which is only intended for your ears. On my way, three miles from Grizzly Flat, near trail leading to Mandon, I quietly stole in upon Mr. Gabe Wernitz, a bachelor, I suspect, for he was making cakes. So, while he was busy, I slipped into my pocket a rich quartz specimen, found in the

Secret Lode,

Which he has been secretly working, and doing fully as well, if not a great deal better, than his neighbors imagine. The specimen I pocketed he gave me, which I forgot to state; but it was not from a pocket lode, but from one which has every appearance of being a true fissure vein, granites forming the east and hanging wall and slate the west. It is not large. Good things are often packed in small bundles. It varies from six inches to 20 inches in width. It has three paying chutes, works, by mill process, from \$15 to \$20 per ton, average assays from \$100 to \$150, and ought to pay at least from \$60 to \$100, if he only knew the secret of the Fryer, or some other good process of reducing his ores and sulphurates. It is opened by a tunnel, 225 feet on the lode. A further run of 100 feet will obtain a depth from surface of 225 feet, and will reach all the paying chimneys.

Between this point—Henry's Diggings and Mandon—is the Crystal mine, owned by S. S. Alexander, of Oakland. It is not worked at present, but operations will probably soon commence. Heard it highly spoken of by Mr. Bradley, who is interested in an extensive gravel claim at Henry's Diggings, which, by this way, will receive due notice, with other claims under the general heading of "Hydraulic Mining South of the American River." K.

How Valuable Mines should be Recognized, Prospected and Worked.

[For the Press by E. G. G.—No. 2.]

To recognize and prospect the three classes of mineral veins or deposits enumerated in our last, should be proceeded upon the following plan:

Fissure Veins.

An inclined shaft should be sunk with the ledge and on the hanging wall of it for at least 50 feet, so as to insure a correct view of the dip. If such dip is less than 45 degrees from the horizontal, it would be well to abandon the ledge; experience has shown that no fissure vein or paying lode has less than 45 degrees.

But if the investigation as to the dip is satisfactory, proceed to run some 20 feet horizontally either way from the shaft along the hanging wall of the ledge, thus enabling you to obtain the exact course of the ledge with reasonable certainty. Now cross through the ledge to the foot wall on both ends of your drifts, and repeat the operation, if satisfactory on one place on two or three different places of your claim and you can prove to yourself or any outsider or mining expert the value of your claim at a glance. You can then proceed to work in a systematic manner, as will be explained hereafter.

This is for fissure veins. If you have a smooth hanging wall and a rugged foot wall (the latter, though, may be smooth here and there) no matter what the bedrock consists of, you can count with a reasonable certainty on having a true fissure vein. Gold ledges are found in primary period formation; slate, syenite, gneiss, etc., and eliver in all older formations, but can hardly be looked for in limestone.

On Wedge-shaped Mineral Deposits,

As described in our last, you will by going down on the hanging wall find the same rugged and varying vertically as well as horizontally, while the foot wall is in most cases as the hanging wall in fissure veins. A reasonable amount of prospecting should be done on both walls and at some depth before you draw your conclusions. Deposits of this sort may be valuable, especially if gold bearing, but can hardly be recommended for a legitimate mining enterprise. In mountains which are bare and allow their whole formation to be recognized, these veins are found on the side, and you can readily infer there is a true ledge further up which may be prospected for accordingly. But on formations which have been much subject to the water or glacial period, the caps of such mountains might have been displaced and you are apt to find the mentioned deposits on what is apparently the top of the hill. At any rate, ledges of that sort are never a great distance from a fissure vein.

Now to the third class, the

Mineral Slides.

They are caps of ledges carried away and deposited elsewhere, and can be easily recognized as such by their contents. The ore in

them is found to consist of sharp angled shattered fragments, cased, no doubt, by the sliding motion which has kept the whole in place but shattered its contents. Such caps are generally of no value but have sometimes for their extreme richness been the cause of serious disappointments.

(To be Continued.)

Gems and Precious Stones.

[Written for the Press by HENRY G. HANES.]

(Continued from last Week.)

D. Spinel—Spinel Ruby, Almandine Ruby, Balas Ruby, Rubicelle, Pleonast.

When pure the spinel has the following composition: $MgO + Al_2O_3$; magnesia 28, alumina 72, = 100. But it frequently is found with part of this magnesia replaced by protoxide of iron, lime or manganese. The alumina on the other hand gives way to the sesquioxide of iron in part, so taken on the whole the composition is somewhat mixed and doubtful; but in treating this mineral as a gem we have only to consider the purer forms.

The spinel ruby is deep red or scarlet; the balas ruby is rose red; the rubicelle is yellowish or orange red; the almandine is violet, while the pleonast is black.

Blue, yellow and green varieties are of rare occurrence. The blue is called sapphire and the green chlorospinel.

This mineral is often confounded with the garnet, which is erroneous, for all varieties of garnet contain silica, which the true spinel does not.

Spinel scratches quartz, but is scratched by the sapphire. Its specific gravity is from 3.5 to 4.1. The red variety has a specific gravity of 3.523, while the black is 3.575. Luster vitreous to splendid, from opaque to transparent. B. E. the spinel remains infusible if no fluxes are added. The red variety changes to brown or even black, on cooling changes to green and then returns to the original color after passing through several tints. Borax dissolves it slowly; so does microcosmic salt more readily, taking from the mineral a reddish hue when hot, and cooling to a faint chrome green color. Soluble, but with difficulty, in highly concentrated sulphuric acid; wholly decomposed by fusion with bisulphate of potash. Swells up with soda but does not fuse.

The spinel crystallizes in the isometric system, the crystals being octahedrons and their modifications. Although it has been shown that the spinel is found of many colors, yet the streak or powder is always white. Its fracture is conchoidal.

The name "carbunculus" was applied to this gem by the ancients, and also "spinella carbunculus." It is not uncommon at the present day to hear red garnets called "carbuncles," especially if they are large and are out cabochon.

Spinel is sometimes found imbedded in granular limestone and associated with serpentine and gneiss. The purest stones come from Ceylon and Siam, where they are generally found as rolled pebbles. It has been found in a similar form in Arizona. It is not uncommon to find it in cavities of lava from some volcanoes.

In the United States it is also found near Amity, N. Y., and Aadover, N. J., but never of a quality to be used as gems.

The blue spinel (sapphire) comes from Sweden. The pleonast or black spinel is found in Ceylon, Bohemia, Tyrol and at Andernach on the Rhine. Small crystals of this variety, of extraordinary luster, are found in old lava on Mount Somma.

The spinel does not become electrical either by friction or heat, nor does it doubly refract light.

There is said to be a tradition in Persia that the mines producing this gem were not known until after a terrible earthquake, which split a mountain from summit to base, and that first they were mistaken for the true ruby.

There is no reason why the spinel should ever be mistaken for ruby. The test of hardness alone is sufficient to distinguish them; holding the stones for a moment on an emery wheel will at once show them to differ. The ruby can scarcely be scratched, while the spinel yields immediately. The difference in specific gravity is also a test easily applied if the stone is unset.

It is impossible to set a value on the spinel; the price fluctuates with the fashion, or, like other goods, with the supply and demand. As an instance, I find it stated that a stone weighing 40 carats of good quality sold in England in 1856 for £400; was sold afterwards at auction for £80, after which it was again sold for £240. The present price of the best quality of spinels may be taken at from \$2.50 to \$40 per carat.

The spinel has been made artificially by strongly heating alumina, magnesia and boracic acid. Another method is to fuse the fluoride of magnesia and aluminum with boracic acid; and still another, to act on magnesium with vapor of chloride of aluminum.

O. F. LIBRARY ASSOCIATION.—We have received the 21st annual report of the S. F. Odd Fellows' library association for the years '75-6. It contains the annual report of the president and librarian, with a list of the accessions to the library. It is an interesting publication.

[Editorial Correspondence.]

The Centennial at Philadelphia.—No. 4.

Day by day the exhibition grows in interest by the addition or uncovering of new attractions; but still the vast buildings present many gaps, with preparatory indications, however, that they are soon to be filled. Although yesterday closed the second week of the fair, I saw great numbers of cars—not less than 20 in all—in various portions of the grounds and buildings, pouring out boxes and bales almost without number. Eight carloads arrived overland only three days ago, filled with Australian goods; which arrival, I am told, will complete that exhibit. When the end of receiving will be, none can tell but those who have power to put an arbitrary end to the admission of any further exhibits. Spain has not yet opened more than one-half of her goods in either of the four principal buildings. France is also much behind. In fact none, with but few exceptions, are yet fully ready with all their exhibits.

It will be readily inferred from the above why I have not yet been able to give comparative descriptions. It is now clearly certain that every foot of the area will be occupied throughout all the 70 or more acres of floor space available for exhibition purposes. In my second letter I think I set down the space at about 62 acres. I am now satisfied it will measure nearer 75—the amount which is claimed in the official publication—and which exceeds the area limit of the largest European exhibit by about 19 acres! Well, this exhibition can't be repeated, with all its pomp and circumstance, for at least a century to come, and so the great American people may be pardoned for making the most of it. No European nation will be likely to attempt to rival it during the present century. It won't pay them—it won't pay us. The great American Centennial is too big a thing to handle with much financial success. In fact, its value and importance ought not—can not be recorded in dollars and cents. Still we may be pardoned for giving

A Brief Financial Exhibit.

The Board of Finance, in its official exhibit under date of November 10th, 1875, reports receipts as follows:

State of Pennsylvania.....	\$1,000,000
City of Philadelphia.....	1,000,000
State of New Jersey.....	100,000
State of Connecticut.....	10,000
Miscellaneous donations.....	40,000
Stock subscriptions, about.....	2,200,000
Total.....	\$4,850,000

The board, under its original organization, was authorized to issue stock to the extent of \$10,000,000, but they estimated in their report of the above date, that \$8,500,000 would cover the necessary expense up to the day of opening. To the amount of \$4,850,000 already enumerated, Congress has since added \$1,500,000, and perhaps it is fair to estimate the sales of stock and other contributions since last November at \$750,000, which would give a total cash aggregate, at this time, of \$7,000,000, leaving but one and a half millions to be realized from the profits of the exposition and the sale of property which can be disposed of after it is over. But whatever may be the result—whether the cost reaches eight and a half or ten millions, there is no doubt that all the bills will be paid, although the stockholders may not receive anything in return for their investment. Probably very few ever expected any return—what they paid was from patriotic motives alone.

There has been no disposition manifested on the part of the commissioners to be niggardly in anything that would really tend to make the exhibition the success that it should reach; nor, so far as I can learn, has any "crookedness" been developed. The management, the contributors and the people at large will undoubtedly have the profound satisfaction, when all is over, to know that everything has been reached which could reasonably be expected to be realized from labor, skill and an honest expenditure of money. Everything has been done upon a liberal—nay, upon a grand scale, and the result, thus far, has been an undoubted surprise to the world, and a matter of national congratulations to the American people. Whatever may be the cost in dollars and cents, it may be set down as a not very extravagant price for the "universal Yankee nation" to pay for a grand Centennial "blow out." It won't come again in the next hundred years; will cost, even at the largest sum mentioned, less than two bits a piece for each man, woman and child in the land, aside from the traveling expenses and admission fees of those who enter into the fullest personal enjoyment of the occasion. Who cares, under the circumstances, for the paltry eight or ten millions which will be sunk in the enterprise?

Attendance and Transportation.

Since the rains to which I alluded in my last have been succeeded by clear and sunny skies, the streets and grounds and attendance have been wonderfully improved; and contrary to my anxiety a week ago, I find that a substantial pavement exists beneath the mud which then covered the main street approach to the Centennial grounds; but for much of a distance no sidewalk is yet visible over that thoroughfare. Although the attendance has largely increased there is yet nothing of the rush which was anticipated by the average

Philadelphian. As a consequence, ample hotel accommodations can still be found and at reasonable prices. A circular before me offers good accommodations at from \$2.50 to \$3.00 per day in a hotel within 200 yards of both the Pennsylvania railroad depot and the exhibition ground and where 1,000 guests can be accommodated, and the Grangers, at their encampment, are still accommodating all who come at even lower prices, hence no one need stay away from the Centennial on account of extravagant hotel prices.

It was estimated by the Centennial Commissioners that the paying visitors at the ground would reach an average of about 65,000 per day. This estimate is altogether too large, probably by about one-third, perhaps nearer one-half. Say the daily average will be 40,000. When that number is reduced by the very large attendance which Philadelphia chiefly furnishes, added to those who can reach the grounds and return to their homes every night by the railroads, it will readily be seen that the city with its special accommodations can easily accommodate all who come to stay. There will be no overcrowding except on a few special days, such as the Fourth of July and a few parade and society days.

At no previous world's fair have such extensive facilities been offered for the transportation of large numbers to and from the grounds, by street and other cars, as have been provided in Philadelphia. There are upwards of 250 passenger trains running in and out of the city every day, a large portion of which are timed for the special accommodation of visitors at the Fair. Excursion trains, morning and night, are thus run in almost every direction from 100 to 150 miles, at very low special rates. Passengers are put down at the grounds from New York in one hour and forty minutes, or at 9 A. M. (the opening hour), and taken back at 5 P. M., at which time the

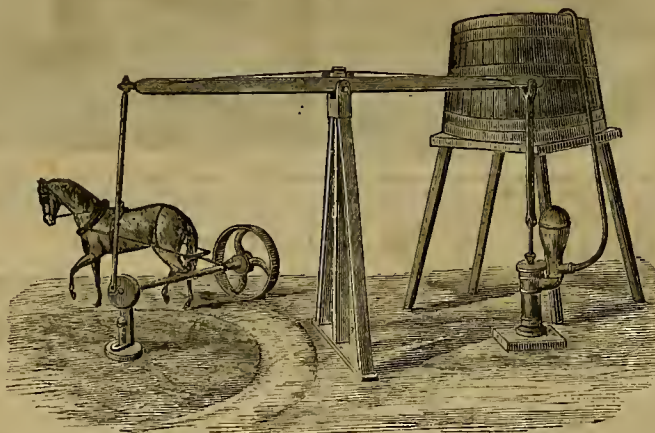
torn from his person. The result of such unmannerly conduct has been to banish nearly all such display of individual nationalities from the grounds and the city, such persons, much to their inconvenience and dislike, having donned the conventional hat, coat, vest and trousers of the "universal Yankee nation." I have since noted only now and then a turban, supplemented with the flowing robe of some isolated Turk, more venturesome than most others of his countrymen.

The Foreign Commissioners and What they are About.

The foreign members of the Centennial Commission—the judges, experts, scientists, etc., are beginning to put in an appearance, and to accommodate them in their investigations the representatives of the press have been removed from their snug quarters and cosy rooms in the judges' hall to less convenient quarters in a large common room in a building erected for "the public comfort." The "press" of course, don't like the change; but they yield with as good a grace as possible to the convenience and possible needs of our foreign visitors and umpires. One half of all the judges have been very properly selected from representative men of foreign nations, and the liberal sum of \$1,000 has been appropriated to each judge, in payment of his expenses, and as some compensation for the time and labor which he will be expected to devote to the specialty to which he is assigned.

Count Dello Sala, the Turkish Commissioner, arrived in New York on Saturday last, as did also, on the same steamer, Sir Sidney Waterlow, M. P., one of the British Commissioners, others having preceded them.

The Germans have some of their best scientists and technical experts on the ground, who will study up the exhibition thoroughly, in all its useful and economical aspects. Prof. Herman, of the polytechnical school at Aix-la-

**HORSE-POWER FOR OPERATING PUMPS.**

machinery stops and the exhibition virtually closes, although all are not necessarily out until 6 P. M. The grounds are not open in the evening at all.

A large number of new cars will be put upon the New York road in a few days, which will consist of an ordinary carriage platform car, fitted up with temporary seats and covered with a cloth roof and curtains to keep out the sand and rain. These cars will be run from New York to the grounds in about two hours—arriving at 9 A. M., and returning at 5 P. M.,—at \$2 for the round trip. After the exhibition is over the cars will be covered and fitted up for regular passenger cars. The commissioners of the exposition, in connection with the various railroad officials, have displayed great energy and care in thus providing special transportation to meet the occasion, and to the credit of Philadelphia it should be known that her citizens have willingly seconded all such efforts, without manifesting any special disposition to make money out of visitors by rendering it inconvenient for them to make their trips to and from the city.

An Interesting Feature Lost.

One of the striking features connected with European international expositions, and especially so to citizens of this country, has been the brilliant uniforms of army and navy officers, the official robes of Eastern men of note, and the many-colored and multifarious forms and styles of garments worn by attendants and visitors from the different nationalities which have there assembled. A display of this character, somewhat limited in extent, was also expected at this exposition. Something of the kind was, indeed, seen on the "opening day," among the large number of Turks, Japanese, Chinese, Greeks, Egyptians, etc., who were in attendance, and the effect was duly appreciated and respected by the orderly people within the grounds. But no sooner had our enraptured visitors reached the public streets of the city than the bad side of Young America began to show itself in a very indecorous manner, and one seldom exceeded by even the ruffian conduct of San Francisco gamblers toward a newly arrived cargo of Chinese. These Centennial visitors were followed through the streets of the City of Brotherly Love, and for aught your correspondent knows, to the very doors of Independence hall, by crowds of idle boys and men, peered at with ill-mannered curiosity, saluted with rough epithets, and, in some instances, I am told, were actually assailed with ruffian violence. In one instance it is said the silken robes of a Chinese official were rudely

ing machine was invented by Thomas Saint, of London. It was seized upon and sold at enormously high prices by the combination monopoly; subsequently perfected and sold at prices within the reach of all, by Kimball & Morton; chief office and manufactory, Bishop street, Glasgow." On more particular enquiry, I learned further that it was in use in England more than 50 years before Elias Howe made his first model! This information rather staggered me; but as it was communicated by a very interesting young lady, I could not master sufficient courage to venture any doubt in regard to its correctness, so I left the history of the sewing machine to vindicate itself.

The sewing machine exhibit at the Centennial is, no doubt, by far the most perfect and complete that was ever made in any country. Seventeen different American companies are represented and four foreign ones—England, Scotland, Sweden and Brazil. The Scotch exhibitor, has already been named. Messrs. Newton, Wilson & Co., 144 High Holborn, London, make the finest and largest foreign exhibition. The machines in both the Scotch and English exhibits have all the novel improvements and accessories common to the American machine. The last named exhibit consists of some 50 machines, of 11 different grades and styles. One of these machines, "England's Queen," it is claimed, "presents some entirely new features, never before realized in a sewing machine." It can be instantly changed, "without stopping the machine," from the lock-stitch to the herring-bone stitch, and to oversewing. These changes are effected by simply turning a screw. The width and length of the stitch are also regulated at pleasure. A machine is also shown for sewing ships' sails.

This party also shows a "pleater," which gathers up the fabric into box-pleats, in front of the needle. The pleats, as they pass under the needle, being fastened to their places by stitching. It is claimed that this is the only pleater in use. It was invented by one of the firm, and has been patented in this country as well as in Europe. The English machines are made quite as ornamental, if not more so than the American. They also appear to be more substantial.

It has been often said and printed that the English have never made a practical success of the manufacture of the sewing machine; but we have here proof to the contrary, for this company, according to their circulars, at least, are manufacturing large numbers daily, many of which, after the home consumption has been supplied, are sold in various parts of Europe, South America, Africa, India and the British colonies. They have three times enlarged their works to meet the increased demand for their machines, and are now making a fourth enlargement, which, when completed, will enable them to turn out 1,000 machines each week.

The Brazilian and Swedish machines are all very plain, but substantial in their make, and are not calculated for fancy work.

W. B. E.

Centennial Grounds, May 23d, 1876.

A Simple Pumping Power.

We present our readers herewith the illustration of a novel horse power for operating pumps, the invention of Mr. D. T. Gillis, late of Stockton, the inventor of several other ingenious and useful devices. The horse power, it will be seen, consists of a centrally pivoted walking beam, one end of which is connected with the pump rod by a pitman, while the opposite end is connected with a crank wheel by a similar pitman. This crank wheel is secured upon the end of a horizontal shaft, which is supported by a suitable standard near the wheel. The outer end of this shaft has a large traction wheel mounted on it, and the horse is hitched to the shaft near the traction wheel. As the horse travels around in a circular track, the traction wheel rotates and the motion is transmitted through the crank wheel, oscillating beam and pitman to the pump rod. This arrangement is extremely cheap and simple, and cannot help but be effective.

The horse power is manufactured by the Sweepstakes plow company, and parties desiring to learn further particulars can address F. A. Hill, San Leandro, Cal.

PAID OFF.—The Consolidated Virginia company have paid their workmen over \$81,000, the Belcher \$62,000, and other mines in like proportion. More money has been paid out this month than any month this year, as there are an unusual number of men employed in making surface improvements, as in putting up the new machinery at the Savage, Hale and Norcross, Gould and Curry, the new stamp mill of the California mining company, the new passenger depot of the Virginia and Truckee railroad company, and many other operations on the surface in all parts of the town.—*Territorial Enterprise.*

The German commissioners, Althons, Broja, Diefenbach, Richter and Koob were shown through the works at Hell Gate on Wednesday, 17th inst. They displayed great interest in the undertaking, inquiring particularly into the subject of rock-drilling as practised there, and in conclusion expressed themselves much pleased at the way in which the work had been conducted, and thought the experiment of a combined blasting operation, as about to be practised there, could not fail to be of the greatest scientific interest.—*Engineering and Mining Journal.*

Banking.

The Merchants' Exchange Bank
OF SAN FRANCISCO.

Capital, Five Million Dollars.

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R. N. VAN BRUNT..... Cashier.BANKING HOUSE,
No. 423 California street San Francisco.KOUNTZE BROTHERS, BANKERS,
12 WALL STREET, NEW YORK,Allow interest at the rate of Four per cent. upon
daily balances of Gold and Currency.
Receive consignments of Gold, Silver and Lead
Bullion, and make Cash advances thereon.
Invite Correspondence from Bankers, Mining
Companies, Merchants and Smelting Works.

French Savings and Loan Society,

411 Bush street, above Kearny..... SAN FRANCISCO

4v27tf G. MAHE, Director.

Business Directory.

J. H. PAGE, J. S. WILSON, WM. E. HALE,
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HALE, PAGE & WILSON,

Commission Stock Brokers, 429 California Street, S. F.
Money Loaned on Leading Stocks.

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In Building of Pacific Insurance Co., N. E. corner Cal
ifornia and Leidesdorf streets,
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BARTLING & KIMBALL,

BOOKBINDERS,

Paper Rulers and Blank Book Manufacturers.
505 Clay street, (southwest cor. Sansome),
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Machinery.

The Ingersoll Rock-Drill

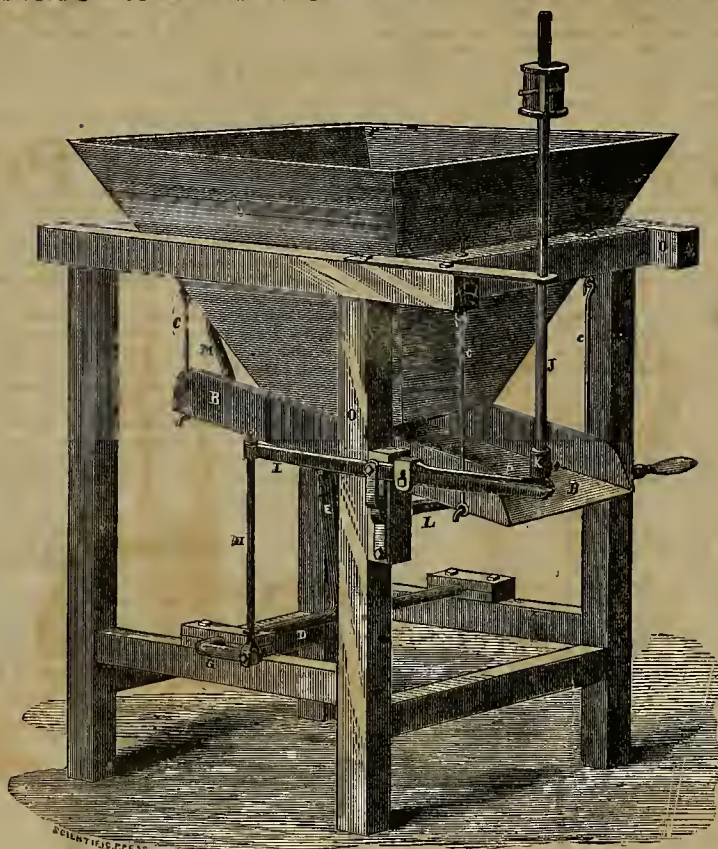


Is Extensively Used in the East and

TAKES THE PLACE OF ALL OTHERS,

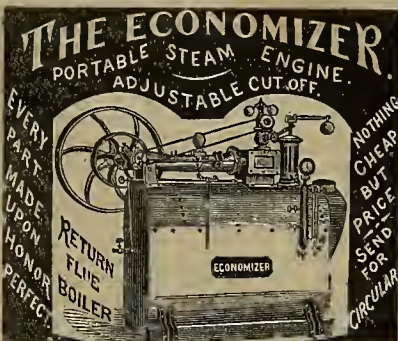
Wherever introduced, because it can be run with less
power, labor and repairs, and do more work than any
other Drill in the market. It has but few parts, is eas-
ily handled, being light, and HAS AUTOMATIC FEED,
which saves labor. WE ASK FOR TRIAL AGAINST
ANY COMPETITOR. For particular information re-
garding Drills or Air Compressors, send for circular toJ. B. REYNOLDS,
426 California StreetWHELPLEY & STORER'S
Desulphurizing Furnaces, Crushers and
Pulverizers forGOLD, SILVER and COPPER ORES,
State, County and single rights for sale at reduced
rates. Machines furnished at short notice.LEVI R. GREENE, Trustee,
69 Kilby Street, Boston, Mass.

TULLOCH'S AUTOMATIC ORE FEEDER.

The TULLOCH AUTOMATIC ORE FEEDERS have been practically tested during the last
year and a half in twenty-seven mills, of from five to eighty stamps each, and have, in every case, giv-
ing perfect satisfaction. Refer to the following Miller California, Con. Virginia, Northern Belle, Leopard, Trench,
Humboldt, Douglas, Phoenix, Hite, Crescent, and others. Prices Reduced. Send for Circulars.

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THE O'HARRA
CHLORIDIZING FURNACE.Guaranteed to Chloridize from 85 to 95 per cent. of
any gold or silver ores that are not more profitable for
smelting. Will also desulphurize ores and put them in
proper shape for working in cupola furnaces.Cost of Roasting and Chloridizing by this
Process:Two cords of wood at \$6.....\$12.00
Two firemen at \$4.....8.00
1500 lbs of salt at 1 1/2c.....22.50
Wear of shoes and power.....1.50Cost for 15 tons.....\$14.00
Cost for one ton.....2.93 1/3In a furnace of three or four times this capacity the
cost is decreased by 20 per cent.The furnace is now working successfully at the Poe
Consolidated Co.'s mines, in the Peavine District. For
further information, apply toD. J. O'HARRA,
Reno, Nevada.Cotton Gins, Printers, Cheese Makers,
Laundries, Cabinet Makers, and All
Manufacturing where Light
Power is Required.

A. L. FISH & CO.,

Sole Agents for California,
9 and 11 First Street, - - San Francisco.Marine Screw Engines
And Boilers for driving Model
Yachts from one to ten feet in
length, and Row-Boats or Skiffs 16
feet and upwards in length; either
plain castings, partly finished, or
complete ready for use, so con-
structed that a speed of from six
to twenty miles per hour can be easily obtained.
The Engine can be quickly detached from the Yacht or
Boat, and is then suitable for Agricultural, Domestic, Me-
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small power only is needed.
100 Scroll Work Designs free on receipt of Stamp.
GEO. PARR, Buffalo, N. Y.'ASBESTOS
COATING

FOR:

STEAM BOILERS, PIPES, ETC.

U. S. & FOREIGN

Salamander Felting Company.



PACIFIC BRANCH,

SEWARD COLE, - Manager,

OFFICE, 317 California street, S. F.

FACTORY, Berry street, bet. 4th and 5th, S. F.

NEVADA AGENCY, 38 North C street, Virginia.

INDESTRUCTIBLE NON-CONDUCTOR OF HEAT

Saves 15 to 30 per cent. in Fuel.

REFERENCES: U. S. Government buildings and principal
manufacturing establishments in the East and on
the Pacific slope; principal mines and mills in Nevada.

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Asbestos Roofing and Paints

FIRE AND WEATHER PROOF;

Asbestos Steam Packing,

Made from Pure Long Fiber Asbestos,

INDESTRUCTIBLE! SELF-LUBRICATING!

Keefe's Boiler Compound,

Prevents the formation of Scale in Boilers and removes
the same, without injuring the iron or
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Circulars, Descriptive Pamphlets, etc., Sent Free.

SEWING MACHINES.—We have a first-class machine
we wish to dispose of on favorable terms. Apply at
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Metallurgy and Ores.

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IMPORTERS OF AND DEALERS IN

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Having been engaged in furnishing these supplies since
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per ounce Troy at different degrees of fineness, and val-
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Ores worked by any process.
Ores sampled.
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Plans furnished for the most suitable pro-
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Special attention paid to the Mining and
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On all kinds of Ores, and particular attention

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Instructions in Assaying,

Chemical Analysis, Determination of Minerals, and
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HENRY G. HANKS

Will receive a few pupils at his new laboratory, 617
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QUICKSILVER FLASKS,

Tested to 1,000 lbs. per Square Inch,

For Sale in Lots to Suit, by

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LEOPOLD KUH,

(Formerly of the U. S. Branch Mint, S. F.)

Assayer and Metallurgical
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The undersigned, owners of LESCHOT'S PATENT
for DIAMOND POINTED DRILLS, now brought to the
highest state of perfection, are prepared to fill orders
for the IMPROVED PROSPECTING and TUNNELING
DRILLS, with or without power, at short notice, and
at reduced prices. Abundant testimony furnished of
the great economy and successful working of numerous
machines in operation in the quartz and gravel mines
on this coast. Circulars forwarded, and full infor-
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SAN FRANCISCO

Pioneer Screen Works,

Removed to 32 Fremont Street, near Market.

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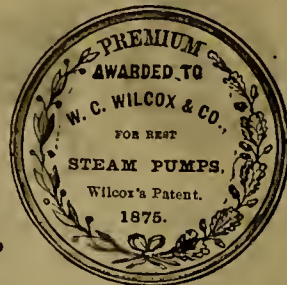
Manufacturer of perforated
sheet metals of every descrip-
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large supplies at favorable rates.
This is the only establishment
on the Coast devoted exclusively
to the manufacture of screens"SPEAKS WELL," ETC.—We would return thanks for
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GOLD MEDAL

AWARDED TO

San Francisco Steam Pumps.



AFTER ONE OF THE

MOST THOROUGH TRIALS

Ever Had in the United States,

BETWEEN COMPETITORS

—OF—

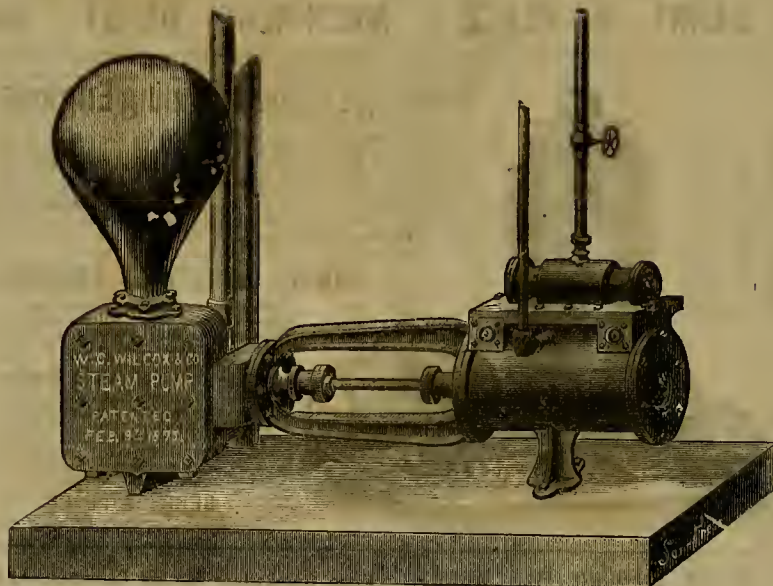
Best Established Reputation,

In which, at great expense, the different Steam Pumps were tried under every test known to experts, the Examining Committee of the Tenth Industrial Fair of the Mechanics' Institute have awarded to us their

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Best Steam Pumps on Exhibition.



We are prepared to furnish PUMPS UNDER CONTRACT, guaranteeing their ability to perform any specific work for which steam pumps are adaptable, such as

RAISING WATER FROM MINES,

FOR WATER WORKS,

FEEDING BOILERS, RAISING WATER FROM WELLS; STEAMER AND SHIP PUMPS, ETC.

We would also call the attention of those interested, to our Direct Acting Deep-Well Pumps for raising water from

Any Desired Depth.

Also to our Especial Construction of Pumps FOR HANDLING QUICKSILVER or heavy liquids.

We claim that our Pumps are the **best** ever made in **simplicity** of construction, economical use of power, **durability** and perfect adaptability for general uses, and we ask all persons interested to investigate **our title to this claim.** Salesrooms at our Machine Shop, 114 and 116 BEALE STREET, SAN FRANCISCO.

W. C. WILCOX & CO., Proprietors.

BEFORE PAINTING YOUR HOUSES

Send for Sample Card and Circular and Carefully Examine the

AVERILL CHEMICAL PAINT,
MIXED READY FOR USE.

This Paint is prepared in liquid form, BEADY FOR THE BRUSH. It requires no addition of oil or spirits. It is composed of the best materials known to the trade—Pure Linseed Oil, Strictly Pure White Lead, Pure Zinc, and the finest of coloring matter for tinting. It is the **BEST, CHEAPEST, MOST DURABLE AND BEAUTIFUL PAINT IN THE WORLD.** Is just what is wanted by every farmer, mechanic and everybody who has a house, fence, barn, or wagon to paint. Requires no skilled labor, as any one can apply it who can handle a brush. It is put up in cans of any required size, from a quart to five gallons, and is sold by the GALLON. It gives a firm, elastic and brilliant glossy finish, and will neither crack, peel or wash off, like most paint in common use, but is proof against rainstorms and all action of the elements. Buildings painted with this paint five years ago look fresh and like new to-day and will need no more paint for years. Of no other paint can this be said and proved.



The Averill Chemical Paint Company supply a long-felt want. They not only furnish a Paint more lasting, handsomer, and at the same time cheaper than the best of others, but it is in a liquid form—white and all the fashionable and most exquisite shades—ready for the brush. So that farmers, in fact everybody, can be their own painter if necessary. Indeed, all the buildings upon which the Averill Chemical Paint has been applied, are marvels of beauty.—*Christian Union.*

We know of no subject of such importance to householders as that of a good, handsome, durable paint for their dwellings. Within the past few years we have watched the progress of the Averill Chemical Paint and have had frequent opportunities to test it fully. We think it just the article to supply the need, and give it our hearty endorsement.—*N. Y. Independent.*

From the Thousands of Testimonials sent us, we select the following, which we present for your careful consideration:

A PAINT FOR FARMERS.—Prof. J. B. Turner, Jacksonville, Ill., is a man of great practical knowledge and experience; hence, we attach a great deal of value to the following, from his pen, which we find in the *Prairie Farmer*:

"Some two years ago I sent for and got from a barrel to a barrel and a half of Averill Chemical Paint, of light dun color, which I thought would suit me well enough for all work—houses, doors, blinds, fences, bee-hives, wagons, tools and all. I put two coats upon my residence here, and run over three or four of my smaller farm houses on my farms. With what was left I painted my bee-hives, wagons, wheelbarrows, rollers, harrows, fences, etc., and on all these buildings, implements, tools, gates, etc., the paint is as hard and glossy to-day, as far as I can see, as it was a month after it was put on, and bids fair to hold its own at least for five years to come, (if not ten of them,) better than ordinary white lead and oil does for even two years.

"I have watched it now for about two years with interest and care, and have never found a single spot where it peeled, cracked, or chipped off, as our other paints do. Others who have used this paint like it equally as well. But the point is, I can take one and the same keg and brush, and go over all my buildings, wagons and tools, with no needless waste of paint, brushes or time. It is quite as good for inside finish, as it leaves a coat that shines and washes like glass."—*Moore's Rural New Yorker.*

THE AVERILL PAINTS.—In reply to some inquiries of our readers, we would state that we have given these paints, prepared by the Averill Chemical Paint Company, a full trial, and they appear to possess all that is claimed for them; spreading easily, adhering well, drying soon, and imparting handsome shades of color to the surface covered. Farmers and others who do their own painting, may avail themselves of the convenience of purchasing these paints, of any desired shade, already mixed for use, at a very reasonable price.—*Cultivator and Country Gentleman.*

TO THE CALIFORNIA CHEMICAL PAINT CO: Gentlemen—In reply to your letter I have to state that for more than six years I have dealt in and used your paint. I have during that time carefully observed its application and use, and from practical knowledge can certify to its unrivalled excellence. During my six years' acquaintance with it, there has not come to my knowledge a single instance of failure in any case where it has been used. All to whom I have supplied it unite in commending it for its superior claims over all other paints now in use. The Averill Paint externally used, or, in other words, exposed to the action of the weather, neither rubs off nor changes color, as do other paints, and will retain its freshness and adhesive property for years. Pure lead and oil will in a short time become dry, and are easily rubbed off; the loss of oil leaves the lead in a dry, oxidized state. As a matter of economy the claims of the Averill Chemical Paint to popular appreciation and general use are beyond question. A house properly painted with it once will be better preserved, and present a neater appearance at the expiration of seven years, than it would if twice coated with lead and oil paints now in use. There can be no question, then, that to use it is both labor-saving and economical. So well assured and convinced am I of its established right to this distinction over all kinds, that had I fifty houses of my own to be painted, the "Averill" alone should be my choice and used.

Yours, very truly, S. J. ALDEN, Druggist.

PLACERVILLE, October 7, 1875.

TO THE CALIFORNIA CHEMICAL PAINT CO: Gentlemen—In reply to your note of the 13th inst., I willingly state that the work done by you in painting the exterior of the North Hall or College of Letters is in every way satisfactory, and the appearance of the building since it was painted excites the favorable comment of all who have seen it. As I have had occasion to use the Averill Paint before, my experience has been such that I prefer it to any and all others when properly applied. I am very truly yours,

ROBT. E. C. STEARNS.

Sample Card of Colors Sent Free on Application.

Be Sure and Write for One and Examine for Yourself before Buying Any Other.

CALIFORNIA CHEMICAL PAINT CO.

117 PINE STREET, SAN FRANCISCO.

BEST ON THE COAST.—In copying an article the *Farmers' Journal* says: We found the enclosed item in the *PACIFIC RURAL PRESS*, the best paper of its class on this coast. Mr. M. Eyre, Jr., is the poultry editor.

SUTTER CREEK, February 26th, 1875.
MRS. DEWEY & CO.—I have received my Letters Patent through your Agency, and, for your promptness, accept my thanks. Yours, S. N. KNIGHT.

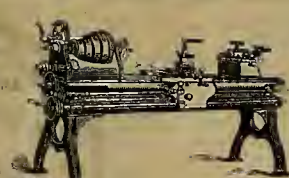
SEVERAL FIRST-CLASS SEWING MACHINES can be had at favorable rates to the purchasers, if ordered soon, from the Grangers' Business Association, N. E. Cor Davis and California streets, S. F.

BOUND VOLUMES of the *MINING AND SCIENTIFIC PRESS* from Jan. 1st, 1864, are for sale at this office at \$5 per volume, two volumes a year. Unbound at \$3 per volume.



ASHCROFT'S
Steam Gauges.

The very best in the country. A large stock at reduced prices.



ENGINE LATHES, IRON PLANERS,
SHAPERS, POWER DRILLS, Etc.,
IN STOCK.

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MUNSON'S BEST.

Large Stock Always on Hand.

Send for list and discounts, which are ten per cent. below any other dealer.

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Pressure Blowers.



NATHAN & DREYFUS'

Self-Oilers and Cylinder Cups.

Save from fifty to eighty cent. of oil over the old method.



Emery Wheels.

WARRANTED

Best in the Market.

For Sale only at **BERRY & PLACE'S MACHINERY DEPOT, San Francisco, Cal.**

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Chemical Laboratory and Bullion Melting Rooms.

Thomas Price (formerly of the San Francisco Assaying and Refining Works), having fitted up the old Pacific Mail Building, No. 524 Sacramento street, corner Leidesdorff, as an Assay Office, Chemical Laboratory and Bullion Rooms, is now prepared to make assays of the precious and useful metals and their ores, as well as complete or partial analyses of all minerals, salts, waters or other substances that may be desired, and is prepared to receive deposits of Bullion for melting into bars, refining, parting and coining.

Special attention being paid to the treatment of Base Bullion, and he hopes that his long residence and experience in his profession will entitle him to a reasonable portion of the business of his friends and public generally.

LEVI STRAUSS & CO.,

Patent Riveted

Clothing.

14 & 16 Battery St.,
San Francisco.



These goods are specially adapted for the use of FARMERS, MECHANICS, MINERS, and WORKING MEN in general. They are manufactured of the Best Material, and in a Superior Manner. A trial will convince everybody of this fact.

Patented May 12, 1873.
USE NO OTHER, AND INQUIRE FOR THESE GOODS ONLY.

THOMPSON BROTHERS, EUREKA FOUNDRY,

Light and Heavy Castings of Every Description Manufactured.

Sole Proprietors and Manufacturers of

LYNCH'S

Ventilating and Illuminating Tile,

The Only Illuminating Tile Manufactured for Lighting Cellars, Basements and Dark Rooms which provides proper ventilation for such places.

129 and 131 Beale Street,

BET. MISSION & HOWARD, - - SAN FRANCISCO.



With Solid Heads. These screws have excellent thread and highly polished solid heads. They are economical and durable. They can be used repeatedly, as the heads are not injured by the slipping of the screw driver. For all purposes they are far superior to copper screws. Manufactured by Adams Nickel Plating & Mfg Co., South Windham, Conn. E. T. Allen, agent for manufacturers, 330 Sansome Street, San Francisco.

IRON PIPE.

Having been appointed Agents for the Washington Pipe Works, we are prepared to ship from store, Pipe and Fittings at the lowest market prices.

BERRY & PLACE, San Francisco.

TREADWELL'S OLD STAND.

JOHN LUTTRELL MURPHY,

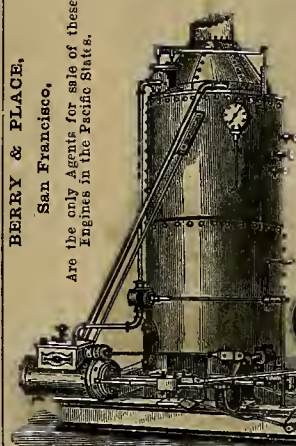
Attorney and Counsellor at Law,
NO. 535 CLAY STREET,
SAN FRANCISCO.

Roasting of Gold and Silver Ores, and the Extraction of their Respective Metals without Quicksilver. 1870. It contains 142 pages, embracing illustrations of furnaces, implements and working apparatus. Price \$2.50 coin, or \$3 currency, postage free. Published and sold at this office.

BERRY & PLACE,

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Are the only Agents for sale of these



Hoisting Engines. Mining Engines.

COOK, RYMES & CO.'S celebrated Hoisting Engines have been too long in use on the Pacific coast to require any special recommendation from us. They are well known from Alaska to Mexico. We would refer with confidence to any one of the hundreds in use. They still sustain their old reputation, the manufacturers not having followed the common practice of reducing the quality of material and workmanship to compete with cheaper engines. They have lately been greatly improved by adding large drums, and reverse motions.

MINING HOISTING ENGINES.

(Manufactured by the same parties.)

Our new Mining Engine is built from plans and specifications of several of our most successful MINING ENGINEERS, and the result is the most complete

Double Drum Hoisting Engine

Ever built. Their advantages will be seen at a glance by any one familiar with the necessities of a mine. These engines may be seen in use in Ophir, Con. Virginia, Chollar, Europa, Niagara, Leviathan, Phil Sheridan, and several other mines on the Comstock Lode. For sale only at

BERRY & PLACE,
(Successors to Treadwell & Co.)

BLACK DIAMOND FILE WORKS.



G. & H. BARNETT,
Manufacturers of Files of every Description

Nos. 39, 41 and 43 Richmond street,
Philadelphia, Pa.

Sold by all the principal hardware stores on the Pacific Coast. LINFORTH, KELLOGG & CO., General Agents for the Pacific Coast.

PHELPS Manufacturing Co.,

MANUFACTURERS OF ALL KINDS OF
Wharf and Bridge Bolts, Railroad Trestle Work, Car Frames and Bolts, Machine Bolts, Set Screws and Tap Bolts, Lag or Coach Screws.

ALL STYLES OF FANCY HEAD BOLTS.
HOT AND COLD PRESSED HEXAGON AND SQUARE NUTS, WASHERS, BOLT ENDS, TURN-BUCKLES, ETC., ETC.

13, 15 & 17 Drumm St., near California,
SAN FRANCISCO, CAL.

Mining and Other Companies.

Amador Canal and Mining Company.

Location of principal place of business, San Francisco, Cal. Location of works, Amador County, Cal. Notice is hereby given, that at a meeting of the Board of Directors, held on the ninth day of May, A. D., 1876, an assessment, No. 1, of three dollars (\$3.00) per share was levied upon the capital stock of the corporation, payable immediately, in U. S. gold coin, to the Secretary, at the office of the company, room No. 2, 418 California street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the 13th day of June, 1876, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Wednesday, the fifth day of July, 1876, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors. J. W. CLARK, Secretary.

Office, Room No. 2, 418 California street, San Francisco, Cal.

Cherokee Flat Blue Gravel Company.

Location of principal place of business, San Francisco, California. Location of works, Cherokee Flat, Butte County, California. Notice is hereby given, that at a meeting of the Board of Directors, held on the 8th day of June, 1876, an assessment, No. 26, of five cents per share, was levied upon the capital stock of the corporation, payable immediately, in United States gold coin, to the Secretary, at the office of the company, Room 13, No. 328 Montgomery street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 18th day of July, 1876, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Saturday, the 26th day of August, 1876, to pay the delinquent assessment, together with costs of advertising and expenses of sale. By order of the Board of Directors. O. H. BOGART, Secretary.

Office, Room 13, No. 328 Montgomery street, Safe Deposit Building, San Francisco, California.

Gover Mining and Milling Company.

Stockholders' Annual Meeting. The regular annual meeting of the stockholders, for the election of officers and the transaction of business, will be held at the company's office, No. 402 Front street, room 8, in the city and county of San Francisco, on Tuesday, June 13th, 1876, at one o'clock P. M.

W. O. WILSON, Secretary.

Hope Quicksilver Mining Company.—Lo-

cation of principal place of business, San Francisco, California. Location of works, Unsubdivided Mining District, Sonoma County, California. Notice is hereby given, that at a meeting of the Board of Directors, held on the 12th day of May, 1876, an assessment (No. 1) of three (3) cents per share was levied upon the capital stock of the corporation, payable immediately, in United States gold coin, to the Secretary, at the office of the company, room 2, No. 408 California street, San Francisco, California.

Any stock upon which this assessment shall remain unpaid on the 15th day of June, 1876, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 10th day of July, 1876, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

JACOB HARDY, Secretary.

Office, Room 2, No. 408 California street, San Francisco, Cal.

Manhattan Marble Company of Califor-

nia. Location of principal place of business, San Francisco, Cal. Location of works, Oakland, Alameda Co., State of California.

Notice is hereby given, that at a meeting of the Directors, held on the 23d day of May, 1876, an assessment (No. 9) of three dollars per share was levied upon the capital stock of the corporation, payable immediately, in United States gold coin, to the Secretary of the company at his office, Nos. 13 and 15 Fremont street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the first day of July, 1876, shall be deemed delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 17th day of July, 1876, at 12 o'clock M., to pay the delinquent assessment, together with costs of advertising and expenses of sale.

L. L. ALEXANDER, Secretary.

Office, Nos. 13 and 15 Fremont street, San Francisco, Cal.

Mariposa Land and Mining Company

of California. Location of principal place of business, San Francisco, Cal. Location of works, Mariposa County, Cal.

NOTICE.—There are delinquent upon the following described stock, on account of assessment (No. 5), levied on the second day of May, 1876, the sum of \$1.00 amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Alexander & Co, J. B.,	unissued	100	\$ 100 00
Adams, Thomas.....	1164	100	100 00
Adams, Thomas.....	1165	100	100 00
Adams, Thomas.....	A 3	50	50 00
Adams, Thomas.....	A 4	50	50 00
Bramagin, J. H.....	unissued	3050	3050 00
Bramagin, J. H.....	426	25	25 00
Bramagin, J. H.....	427	25	25 00
Bramagin, J. H.....	1112	100	100 00
Bramagin, J. H.....	1113	100	100 00
Bramagin, J. H.....	1114	100	100 00
Bramagin, J. H.....	1115	100	100 00
Bramagin, J. H.....	1116	100	100 00
Bramagin, J. H.....	1117	100	100 00
Bramagin, J. H.....	1118	100	100 00
Bramagin, J. H.....	1119	100	100 00
Bramagin, J. H.....	1120	100	100 00
Bramagin, J. H.....	1121	100	100 00
Bramagin, J. H.....	1122	100	100 00
Bramagin, J. H.....	1123	100	100 00
Bramagin, J. H.....	1124	100	100 00
Bramagin, J. H.....	1125	100	100 00
Bramagin, J. H.....	1126	100	100 00
Bramagin, J. H.....	1127	100	100 00
Bramagin, J. H.....	1128	100	100 00
Bramagin, J. H.....	1129	100	100 00
Bramagin, J. H.....	1130	100	100 00
Bramagin, J. H.....	1131	100	100 00
Bennett, N. R.....	unissued	100	100 00
Bond & Co.....	unissued	700	700 00
Bogart, J. O.....	unissued	700	700 00
Bramagin, J. H.....	1187	100	100 00
Bramagin, J. H.....	1188	100	100 00
Bramagin, J. H.....	1189	100	100 00
Bramagin, J. H.....	1190	100	100 00
Bramagin, J. H.....	1191	100	100 00
Bramagin, J. H.....	1192	100	100 00
Bramagin, J. H.....	1193	100	100 00
Bramagin, J. H.....	1194	100	100 00
Bramagin, J. H.....	1195	100	100 00
Bramagin, J. H.....	1196	100	100 00
Bramagin, J. H.....	1214	100	100 00
Bramagin, J. H.....	1215	100	100 00
Bramagin, J. H.....	1216	100	100 00
Bramagin, J. H.....	1217	100	100 00
Bramagin, J. H.....	1218	100	100 00
Bramagin, J. H.....	1219	100	100 00
Bramagin, J. H.....	1220	100	100 00
Bramagin, J. H.....	1221	100	100 00
Bramagin, J. H.....	1222	100	100 00
Bramagin, J. H.....	1223	100	100 00
Bramagin, J. H.....	1224	100	100 00
Bramagin, J. H.....	1225	100	100 00
Bramagin, J. H.....	1226	100	100 00
Bramagin, J. H.....	1227	100	100 00
Bramagin, J. H.....	1228	100	100 00
Bramagin, J. H.....	1229	100	100 00
Bramagin, J. H.....	1230	100	100 00
Bramagin, J. H.....	1231	100	100 00
Bramagin, J. H.....	1232	100	100 00
Bramagin, J. H.....	1233	100	100 00
Bramagin, J. H.....	1234	100	100 00
Bramagin, J. H.....	1235	100	100 00
Bramagin, J. H.....	1236	100	100 00
Bramagin, J. H.....	1237	100	100 00
Bramagin, J. H.....	1238	100	100 00
Bramagin, J. H.....	1239	100	100 00
Bramagin, J. H.....	1240	100	100 00
Bramagin, J. H.....	1241	100	100 00
Bramagin, J. H.....	1242	100	100 00
Bramagin, J. H.....	1243	100	100 00
Bramagin, J. H.....	1244	100	100 00
Bramagin, J. H.....	1245	100	100 00
Bramagin, J. H.....	1246	100	100 00
Bramagin, J. H.....	1247	100	100 00
Bramagin, J. H.....	1248	100	100 00
Bramagin, J. H.....	1249	100	100 00
Bramagin, J. H.....	1250	100	100 00
Bramagin, J. H.....	1251	100	100 00
Bramagin, J. H.....	1252	100	100 00
Bramagin, J. H.....	1253	100	100 00
Bramagin, J. H.....	1254	100	100 00
Bramagin, J. H.....	1255	100	100 00
Bramagin, J. H.....	1256	100	100 00
Bramagin, J. H.....	1257	100	100 00
Bramagin, J. H.....	1258	100	100 00
Bramagin, J. H.....	1259	100	100 00
Bramagin, J. H.....	1260	100	100 00
Bramagin, J. H.....	1261	100	100 00
Bramagin, J. H.....	1262	100	100 00
Bramagin, J. H.....	1263	100	100 00
Bramagin, J. H.....	1264	100	100 00
Bramagin, J. H.....	1265	100	100 00
Bramagin, J. H.....	1266	100	100 00
Bramagin, J. H.....	1267	100	100 00
Bramagin, J. H.....	1268	100	100 00
Bramagin, J. H.....	1269	100	100 00
Bramagin, J. H.....	1270	100	100 00
Bramagin, J. H.....	1271	100	100 00
Bramagin, J. H.....	1272	100	100 00
Bramagin, J. H.....	1273	100	100 00
Bramagin, J. H.....	1274	100	100 00
Bramagin, J. H.....	1275	100	100 00
Bramagin, J. H.....	1276	100	100 00
Bramagin, J. H.....	1277	100	100 00
Bramagin, J. H.....	1278	100	100 00
Bramagin, J. H.....	1279	100	100 00
Bramagin, J. H.....	1280	100	100 00
Bramagin, J. H.....	1281	100	100 00
Bramagin, J. H.....	1282	100	100 00
Bramagin, J. H.....	1283	100	100 00
Bramagin, J. H.....	1284	100	100 00
Bramagin, J. H.....	1285	100	100 00
Bramagin, J. H.....	1286	100	100 00
Bramagin, J. H.....	1287	100	100 00
Bramagin, J. H.....	1288	100	100 00
Bramagin, J. H.....	1289	100	100 00
Bramagin, J. H.....	1290	100	100 00
Bramagin, J. H.....	1291	100	100 00
Bramagin, J. H.....	1292	100	100 00
Bramagin, J. H.....	1293	100	100 00
Bramagin, J. H.....	1294	100	100 00
Bramagin, J. H.....	1295	100	100 00
Bramagin, J. H.....	1296	100	100 00
Bramagin, J. H.....	1297	100	100 00
Bramagin, J. H.....	1298	100	100 00
Bramagin, J. H.....	1299	100	100 00
Bramagin, J. H.....	1300	100	100 00

Names.	No. Certificate.	No. Shares.	Amount.
Collins, C. A.....	1187	100	100 00
Collins, C. A.....	1188	100	100 00
Collins, C. A.....	1189	100	100 00
Collins, C. A.....	1190	100	100 00
Collins, C. A.....	1201	100	100 00
Collins, C. A.....	1202	100	100 00
Collins, C. A.....	1203	100	100 00
Collins, C. A.....	1204	100	100 00
Collins, C. A.....	1205	100	100 00
Collins, C. A.....	1206	100	100 00
Cluse, W. B.....	272	100	100 00
Close, David.....	345	100	100 00
Close, David.....	347	100	100 00
Cantor, A. H.....	471	100	100 00
Cantor, A. H.....	472	100	100 00
Colborn, T.....	473	100	100 00
Colborn, T.....	474	100	100 00
Dunpell, T. L.....	unissued	25	25 00
Dunbrell, Lamont.....	unissued	200	200 00
Delavan, C. S.....	277	100	1 00
English, William.....	478	100	100 00
English, William.....	478	50	50 00
Elston, W. A.....	unissued	1100	1100 00
Friss, Chas.....	unissued	200	200 00
Ferguson, Yates.....	33	100	100 00
Fisk, E. H.....	91	100	100 00
Fay, Frederick J.....	470	100	100 00
Govanter, J. A.....	44	100	100 00
Glendenning, Davis & Amory.....	46	100	100 00
Glendenning, Davis & Amory.....	47	100	100 00
Glendenning, Davis & Amory.....	289	100	100 00
Glendenning, Davis & Amory.....	290	100	100 00
Glendenning, Davis & Amory.....	291	100	100 00
Homes, A. P. Jr.....	unissued	100	100 00
Hallgarten & Co.....	unissued	50	50 00
Howard, John P.....	unissued	100	100 00
Hart, Julius.....	333	100	100 00
Hart, Julius.....	334	100	100 00
Holmes, P. W.....	432	1	1 00
Hamburger, J. C.....	438	50	50 00
Homans, E. C.....	1213	100	100 00
Harriott & Noyes.....	1101	100	100 00
Harriott & Noyes.....	1102	100	100 00
Harriott & Noyes.....	1103	100	100 00
Harriott & Noyes.....	1104	100	100 00
Harriott & Noyes.....	1105	100	100 00
Harriott & Noyes.....	1106	100	100 00
Harriott & Noyes.....	1107	100	100 00
Harriott & Noyes.....	1108	100	100 00
Harriott & Noyes.....	1109	100	100 00
Harriott & Noyes.....	1110	100	100 00
Harriott & Noyes.....	1111	100	100 00
Hedges, Allen.....	1138	100	100 00
Hedges, Allen.....	1139	100	100 00
Hedges, Allen.....	1140	100	100 00
Hedges, Allen.....	1141	100	100 00
Hedges, Allen.....	1142	100	100 00
Hedges, Allen.....	1143	100	100 00
Hewden, Kibbreth & Co.....	1210	100	100 00
Hewden, Kibbreth & Co.....	1211	100	100 00
Hewden, Kibbreth & Co.....	1212	100	100 00
Hollick, Edith Gertrude.....	A 5	1	1 00
Hollick, Chas A.....	A 6	1	1 00
Huntington, Geo. M.....	unissued	3	3 00
Ingersoll, M. M.....	unissued	1	1 00
Joslyn, Bach & Co.....	unissued	400	400 00
James, W. H.....	1166	100	100 00
Kent, Edward.....	203	100	100 00
Kennedy, M. F.....	439	1	1 00
Kennedy, Hutchinson & Co.....	476	100	100 00
Kennedy, Hutchinson & Co.....	1207	100	100 00
Kennedy, Hutchinson & Co.....	1208	100	100 00
Kennedy, Hutchinson & Co.....	1209	100	100 00
Kennedy, Geo. H.....	807	100	100 00
Kennedy, Geo. H.....	1158	100	100 00
Loth, M.....	411	50	50 00
Luth, M.....	412	50	50 00
Lamb, O. J.....	unissued	25	25 00
Lewis, D. U.....	214	100	100 00
Leo Arnold.....	273	100	100 00
Monroe & Co, E. S.....	unissued	100	100 00
McGlade, Fred.....	unissued	100	100 00
Mintz-beimer & Hyman.....	35	100	100 00
Meerisboffer & Co.....	98	100	100 00
Meerisboffer & Co.....	99	100	100 00
Meerisboffer & Co.....	100	100	100 00
Meerisboffer & Co.....	101	100	100 00
Meerisboffer & Co.....	102	100	100 00
Moore, Silas H.....	1215	100	100 00
Moore, Silas H.....	1216	100	100 00
Nojce, Ed. H.....	unissued	50	50 00
Nojce, Wm T.....	unissued	10	10 00
Otis & Co, F. A.....	38	100	100 00
Otis & Co, F. A.....	68	100	100 00
Otis & Co, F. A.....	243	100	100 00
Otis & Co, F. A.....	244	100	100 00
Otis & Co, F. A.....	469	100	100 00
Peabody, J. S.....	unissued	300	300 00
Pond, Joel B.....	39	100	100 00
Pond, Anson P.....	74	100	100 00
Pond, Anson P.....	75	100	100 00
Pond, Anson P.....	76	100	100 00
Pond, Anson P.....	77	100	100 00
Pond, Anson P.....	78	100	100 00
Pond, Anson P.....	79	100	100 00
Pond, Anson P.....	80	100	100 00
Pond, Anson P.....	81	100	100 00
Pond, Anson P.....	82	100	100 00
Pond, Anson P.....	409	50	50 00
Pond, Anson P.....	410	50	50 00
Read, Leo & Content.....	unissued	100	100 00
Robbins, Powell & Co.....	unissued	1000	1000 00
Rodwell, C. M.....	1132	100	100 00
Rodwell, C. M.....	1133	100	100 00
Rodwell, C. M.....	1134	100	100 00
Rodwell, C. M.....	1135	100	100 00
Rodwell, C. M.....	1136	100	100 00
Rodwell, C. M.....	1137	100	100 00
Rodwell, C. M.....	1138	100	100 00
Rodwell, C. M.....	1139	100	100 00
Rodwell, C. M.....	1140	100	100 00
Rodwell, C. M.....	1141	100	100 00
Rodwell, C. M.....	1142	100	100 00
Rodwell, C. M.....	1143	100	100 00
Rodwell, C. M.....	1144	100	100 00
Rodwell, C. M.....	1145	100	100 00
Rodwell, C. M.....	1146	100	100 00
Rodwell, C. M.....	1147	100	100 00

And in accordance with law, and an order of the Board of Directors, made on the second day of May 1876, so many shares of each parcel of said stock as may be necessary will be sold at public auction, at the office of the Company, room 33, Nevada block, 363 Montgomery street, San Francisco, California, on Friday, the thirtieth day of June, 1876, at the hour of one o'clock, P. M., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.

LEANDER LEAVITT, Secretary

Office, Room 33, Nevada block, 363 Montgomery street, San Francisco, Cal.

Taylor Mill and Mining Company.—Principal place of business, City and County of San Francisco, Cal. Location of works, Garden Valley Mining District.

Notice is hereby given that at a meeting of the Board of Directors, held on the fifth day of May, 1876, an assessment of twenty (20) cents per share was levied upon the capital stock of the corporation, payable immediately in United States gold and silver coin, to the Secretary at his office, 601 Montgomery street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the twenty-first day of June, 1876, will be delinquent and advertised for sale at public auction, and unless payment be made before, will be sold on Thursday, the sixth day of July, 1876, to pay the delinquent assessment, together with costs of advertisements and expenses of sale.

SAMUEL S. MURPHY, Secretary.

Office, 601 Montgomery street, San Francisco, Cal.

Tremont Mining and Milling Co.—Stockholders' Annual Meeting. The regular annual meeting of the stockholders, for the election of officers and the transaction of business, will be held at the company's office, No. 402 Front street, room 8, in the city and county of San Francisco, on Wednesday, June 14th, 1876, at one o'clock P. M.

MARK T. ASHBY, Secretary.

Empire Tunnel and Mining Company of Utah.

At a Directors' meeting of above company, held on the 16th inst., it was resolved that a meeting of stockholders of the company be convened on Monday, June 19th, 1876, at the office of the company, 635 California street, to decide upon a proposition to increase the capital stock of the company from three hundred thousand (\$300,000) dollars, divided into thirty thousand (30,000) shares of ten (10) dollars each, to seven hundred and fifty thousand (750,000) dollars, divided into seventy-five thousand (75,000) shares of ten (10) dollars each.

(Signed)

S. R. HARRIS,
W. W. DAVIS,
T. E. HUGHES,
E. MOPHTHRIDGE,
WM. SMALL.

San Francisco, May 25th, 1876.

Iron and Machine Works.

WM. HAWKINS. T. G. CANTRELL
HAWKINS & CANTRELL,
MACHINE WORKS,
 210 & 212 Beale St.,
 Near Howard. - - - SAN FRANCISCO.
 MANUFACTURERS OF
 Steam Engines and all kinds of Mill
 and Mining Machinery.

Also manufacture and keep constantly on hand a
 supply of our
 Improved Portable Hoisting Engines,
 From Ten (10) to Forty (40) Horse Power.
 N. B.—Johbing and Repairing done with Dispatch.

FULTON Foundry and Iron Works.

HINCKLEY & CO.,

MANUFACTURERS OF

STEAM ENGINES,

Quartz, Flour and Saw Mills,
 Hayes' Improved Steam Pump, Brodie's Im-
 proved Crusher, Mining Pumps,
 Amalgamators, and all
 kinds of Machinery.

N. E. corner of Tehama and Fremont streets, above
 Howard, San Francisco.

THE RISDON

Iron and Locomotive Works,

INCORPORATED.....APRIL 30, 1868.
 CAPITAL.....\$1,000,000.

LOCATION OF WORKS:

Corner of Beale and Howard Streets,
 SAN FRANCISCO.

Manufacturers of Steam Engines, Quartz and Flour
 Mill Machinery, Steam Boilers (Marine, Locomotive
 and Stationary), Marine Engines (High and Low Pres-
 sure). All kinds of light and heavy Castings at lowest
 prices. Cams and Tappets, with chilled faces, guaran-
 teed 40 per cent. more durable than ordinary iron.

Directors:

Joseph Moore, C. E. McLane,
 Wm. Norris, Wm. H. Taylor, J. B. Haggin,
 James D. Walker.

WM. H. TAYLOR.....President
 JOSEPH MOORE.....Vice-President and Superintendent
 LEWIS R. MEAD.....Secretary

THOS. FENDERGAST. HENRY S. SMITH.

ÆTNA IRON WORKS.

MANUFACTURERS OF

IRON CASTINGS

and MACHINERY,

OF ALL KINDS.

Fremont Street, bet. Howard and Folsom.

SAN FRANCISCO.

SHEET IRON PIPE.

THE

Risdon Iron and Locomotive Works

Corner Howard and Beale Streets,

Are prepared to make SHEET IRON AND ASPHALTUM
 PIPE, of any size and for any pressure, and contract to
 lay the same where wanted, guaranteeing a perfect
 working pipe with the least amount of material.

Standard sizes of railroad Car Wheels, with special
 patterns for Mining Cars. These small wheels are made
 of the best Car Wheel Iron, properly chilled, and can be
 fitted up with the improved axle and box—introduced by
 this company, and guaranteed to outlast any other
 wheels made in this State.

All kinds of Machinery made and repaired.
 247-22-3m JOSEPH MOORE, Superintendent.

Miners' Foundry and Machine Works,
 CO-OPERATIVE,

First Street, bet. Howard and Folsom, San Francisco.

Machinery and Castings of all kinds.

McAFEE, SPIERS & CO.,

**BOILER MAKERS
 AND GENERAL MACHINISTS,**

Howard between Fremont and Beale, St., San Francisco

Schofield's

SULPHURET CONCENTRATOR.

THE BEST MACHINE IN USE FOR
 SAVING SULPHURETS.

No Power Required to Run it, and only a Small Stream of
 Water under a Light Pressure.

ECONOMICAL,

EFFECTIVE,

DURABLE,

AND SURE IN OPERATION.

The especial attention of parties erecting new mills is called to this
 Valuable Improvement.

WE GUARANTEE THAT THIS MACHINE WILL SAVE NINETY PER CENT. OF ALL THE SULPHURETS
 IN THE ROCK AT A MERELY NOMINAL EXPENSE. IT HAS NOW STOOD THE SEVERE
 PRACTICAL TESTS OF OVER A YEAR'S WORK AT DIFFERENT MILLS
 ON THIS COAST, AND HAS BEEN EMINENTLY
 SUCCESSFUL IN EVERY CASE.

The following letters, from practical men who have used this machine, will show to
 those interested what it has accomplished:

BANDERETA MINE,
 Mariposa County, Feb. 7th, 1876.

CHAS. SCHOFIELD, Esq.—Dear Sir: We have been using your Concentrator at our mill
 about six months, and find that it saves over 90 per cent. of the sulphurets contained in the ore,
 and all of the amalgam and quicksilver which escapes from the battery. The machine is simple
 in construction, perfect in operation, and requiring no power to run it, is very economical. I
 can confidently recommend it to all mill men as the best and cheapest Ore Concentrator now in
 use. Yours respectfully, LEVI NOEYS, Superintendent.

NONPAREIL GOLD MINING CO.'S WORKS,

Deer Flat, Tuolumne County, Cal., April 12th, 1876.

MR. CHARLES SCHOFIELD—Dear Sir: It is four months since the Sulphuret Concentrator
 you furnished our company's mill with was first put in operation, and during the past three
 months has been nearly in constant use. The men attending the Concentrator having acquired
 by practice a thorough knowledge of its workings, there is nothing more to be desired; it is
 perfect. A number of mill men have examined the Concentrator and its workings, and pro-
 nounce it the most simple in its construction, perfect in its work, and cheaply run of any they
 had seen. If you think by showing this it will assist you in disposing of your Sulphuret Con-
 centrators, you are at liberty so to do, as it will afford me much pleasure in having contri-
 buted my little mite towards rewarding true merit. Hoping you will meet with complete success,
 I remain yours truly, JOS. J. DOPRAT, Superintendent.

CON. ALABAMA M. CO.,
 Tuolumne County, May 1st, 1876.

C. SCHOFIELD, Esq.—Dear Sir: The Concentrating Machine recently purchased of you is
 now in active operation, and we are highly pleased with it. It saves over 90 per cent. of our
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 safely recommend it to all mill men as the best and most economical machine in use.

M. S. McCONNELL, Superintendent.

WASHINGTON MINE,
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CHAS. SCHOFIELD, Esq.—Dear Sir: Having had one of your Double Rigged Concentrators
 in use now at this Mill for over a year, I take this opportunity of informing you that it is far
 superior to the old English Buddle we have been using for the last four years, not only in a
 saving of labor, but having a less waste of sulphurets in washing.

We have the machine connected with the tail sluice, and receives the sand and water direct
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Two Chinamen do all the work required—one night and the other day—working 12 hours
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 four dollars. As the cheapest, most economical and best working Concentrator I know of I can
 recommend it to others without any hesitation.

Yours truly, GEO. E. WEBBER, Jr.,
 Superintendent Washington Mining Company.

MR. SCHOFIELD—Dear Sir: Having carefully examined your Concentrator, which I have
 seen in successful operation at the Francis Company's Mill and also at the Benton Mills, on
 the Mariposa Estate. I have no hesitation in saying that it is the most valuable Concentrator
 I have met with during my long experience as amalgamator in this country. Its manner of
 catching quicksilver and amalgam is thorough and complete, and it saves the sulphurets clean
 and with a loss of less than ten per cent.

Yours respectfully, L. BURDOW.

MR. C. SCHOFIELD—Sir: I have worked one of your Sulphuret Machines at the Benton
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The following testimonial is from the well known mining expert, PROF. J. E. CLAYTON:

CHAS. SCHOFIELD, Esq.—Dear Sir: Having followed the business of mining engineering
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 chinery for saving gold and concentrating sulphurets, and having in nearly every mining camp
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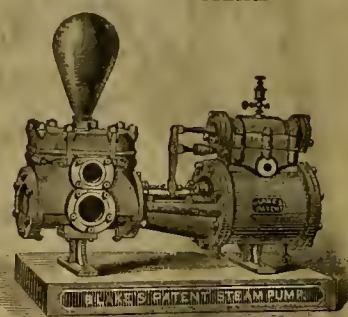
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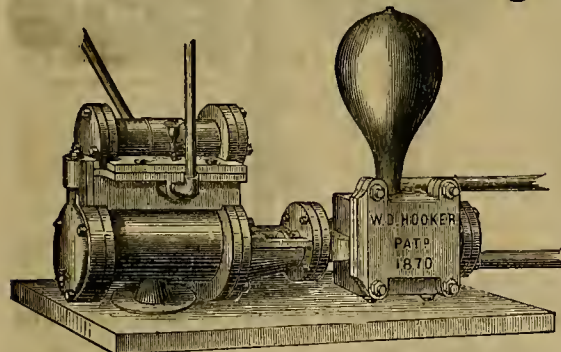
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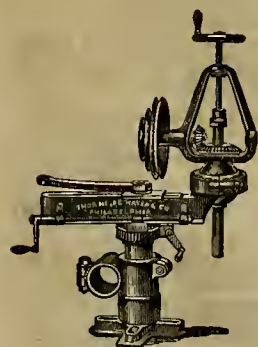
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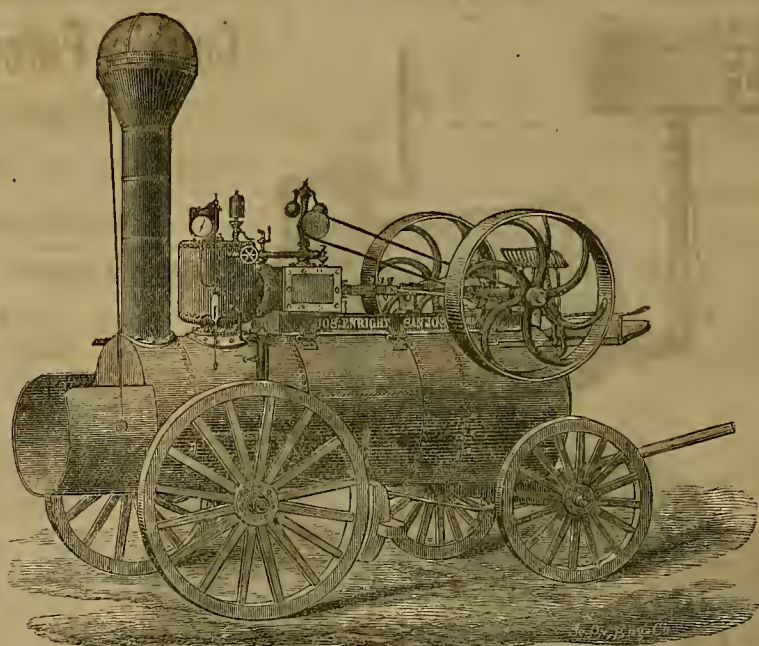
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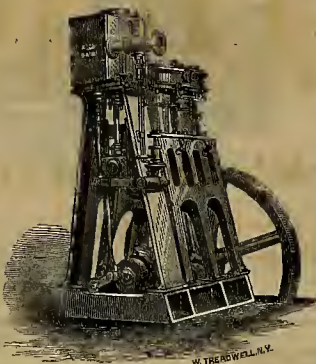
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SIMPLER THAN A PUMP, AS IT REQUIRES NO ATTENTION.

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WERE AWARDED THE HIGHEST PREMIUM
OVER ALL MACHINES EXHIBITED AS
BOILER FEEDERS AT THE CIN.
INNATI EXPOSITION AND
THE ST. LOUIS FAIR.

The cuts show the operation of the Feeder. It was described in detail in the MINING AND SCIENTIFIC PRESS of May 20, 1876.

This Feeder will discharge from 40 to 200 gallons of water at one movement, where a pump would require hundreds of strokes to do the same work.

The water is kept exactly at the proper line, whether running fast or slow, without attention from the engineer.

Feeders, Heaters and Regulators Combined are made on this principle. Simple and economical.

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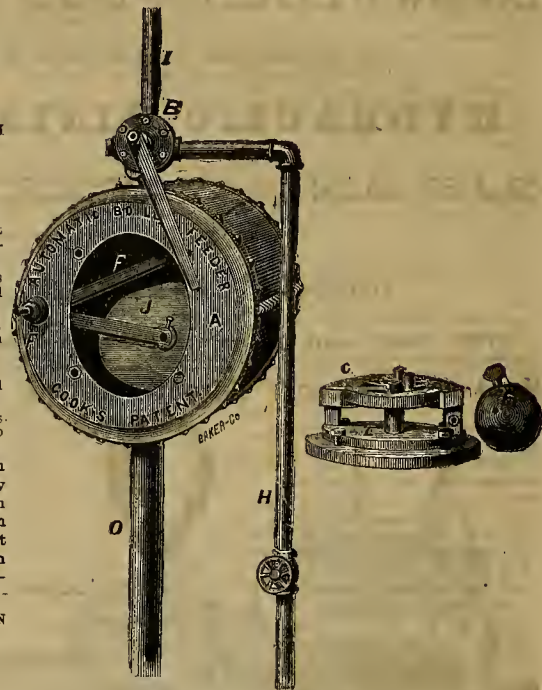
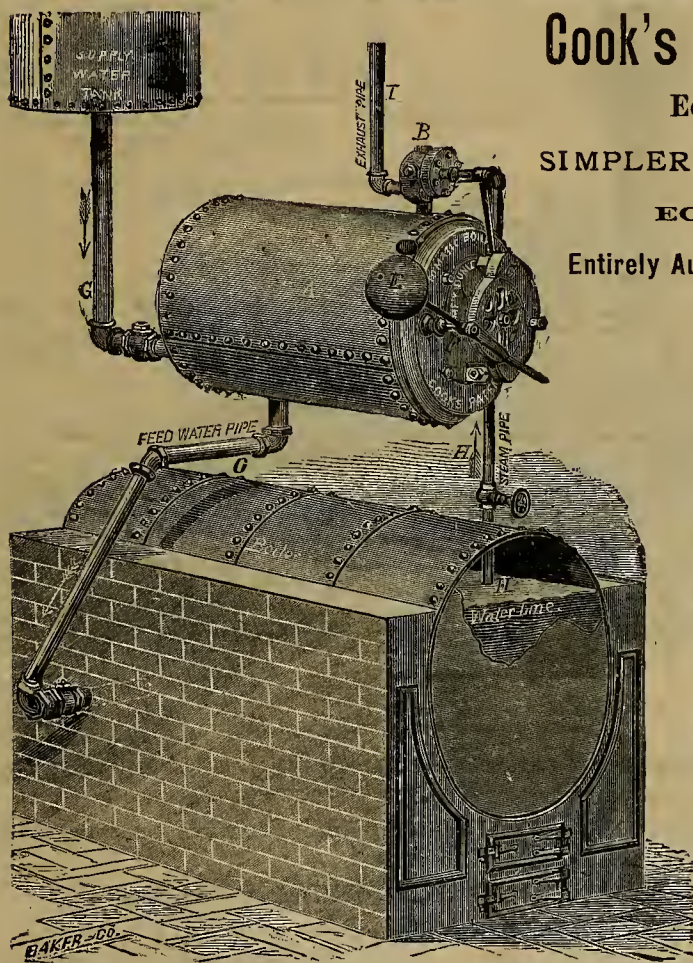
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Patent Solicitors.

SAN FRANCISCO, SATURDAY, JUNE 17, 1876.

VOLUME XXIII
Number 25.

[Editorial Correspondence.]

The Centennial at Philadelphia.—No. 5.

The Board of Judges

Have completed their organization, and are now getting down to the vigorous work before them. They are fast becoming acquainted with each other and are constantly passing from one building to the other to examine thoroughly and fully comprehend the merits of the various specialties upon which they have been commissioned to express an opinion. It is understood that they have adopted a badge which will soon be placed upon their persons, and by which they will be more readily recognized by exhibitors and visitors. Such a distinction would seem to be not only somewhat out of place, but exceedingly annoying as well, from the natural effect it would have of drawing crowds around them when passing through the grounds, and especially while inspecting exhibits, a duty which one would suppose they would desire to perform with as much privacy as possible. The report may not be correct, but at all events it is so circulated and published in the city papers this morning. In one of my letters I mentioned that each judge receives \$1,000 in compensation for his services. Such compensation was so fixed, at first, all around; but recently the pay of the American judges has been reduced to \$600. The Board comprises 125 American judges, who have been carefully selected by the Centennial Commission, and divided into 28 groups. To these have been joined 100 foreign judges, who have been appointed by the representatives of the several foreign governments exhibiting at the exposition. They occupy for their sessions a large and commodious building, containing a large general hall and a sufficient number of small committee rooms to accommodate each of the several divisions or groups. Mr. Scott, of San Francisco, has not yet appeared, but is expected about the 10th of June. Gen. Naglee, of San Jose, has reported his inability to be present on account of sickness in his family. Gen. Gibbons, U. S. A., of Montana, cannot be found; he is out hunting Indians, and Henry Mitchell, of Cincinnati, has been appointed in his stead. About 100 of the foreign judges are already on the ground. The Sunday Opening Question, Etc.

The question of opening the Exposition on Sunday has created a large amount of interest, pro and con. The Commissioners, or a large majority of them, are decidedly opposed to opening; but there is a large element in the city who favor it. They desire the opening, ostensibly, to accommodate the working masses; but from what I can learn it is really a pecuniary matter with them. It will bring thousands into the city on Sunday who now stay away, and largely increase the receipts of the exposition, whereby there will be a better chance for holders of Centennial stock to get a dividend, of which there is now a very slim chance. There is something like a million and a half of Centennial stock held in and near the city, for which the holders are very anxious to get at least a partial return. Several large public meetings have been held to induce the Commission to change their decision. It is said that the one held in and about Musical Fund hall last Saturday evening was attended by 5,000 people. But a quiet little demonstration made by the Presbyterian General Assembly, held last week, and headed by Dr. Prime, seems to have inspired the Centennial managers with new courage to hold out against the popular clamor. It is to be hoped that they will persevere in this decision. Any change therefrom would bring a scandal upon the Exposition and a national disgrace upon our people. I believe the Pacific coast Commissioners are all right in this regard. Indeed but very few of either the managers or the exhibi-

ors favor any change. If the buildings were opened but very few of the exhibitors would uncover their stands or operate their machinery. Six days in the week is as much time as they can give the dear public—considering that they are enlisted for a six months' campaign.

Machinery Hall.

Solomon was undoubtedly a wise man—for his day; but if he had lived in the present age of the world, and been permitted to note the progress of improvement during the last hundred years, he certainly would never have written, in regard to the physical devices of men, "There is nothing new under the sun;" for no man can take a walk through this vast building, and examine the fourteen acres of machinery here displayed, embracing many hundreds of separate and distinct machines, to say nothing of the infinite of their modifications, without being fully convinced that the past century has devised at least a few things that would be "new under the sun," even to the builders of Solomon's temple, were they here to see. But then the sacred writer evidently had in mind the moral "crookedness" of his fellow men rather than their physical devices. Certainly he had never contemplated an "international exposition," or perhaps any machine other than the potter's wheel or the simple device by which his daily amount of "corn" was reduced to flour.

In no part of all these immense grounds is it made so apparent as in machinery hall that life is indeed real and earnest. It is here and

useful and practical results of man's industry as displayed in the main exhibition building. To the mechanic and inventor no such field of study and research has ever before been presented. The handiwork and the skill of some 20 of the leading nationalities of the world are here represented—the whole forming an aggregate which is perfectly bewildering to the uninitiated.

The Structure and Dimensions of the Hall.

The building in which these marvelous results of human industry are collected is itself a marvel. It is 1,403 feet in length, 360 feet in width, with an average height of about 60 feet. Our readers are familiar with its general outside appearance from illustrations already given, which are strictly correct in every particular. Eight main lines of shafting are provided for operating the machinery which has been placed within, which, with the counter shafts, and those in the "hydraulic annex," must measure over two miles in length—all driven by a single engine, the great double-acting upright Corliss. Each main line is capable of transmitting 180 horse-power. The main entrance is upon the east end or right hand of the diagram as shown herewith. The hydraulic annex, as shown, has been constructed for the special convenience of the immense array of pumps which are here shown from Europe and America and of all sizes from a common hand pump to a mammoth rotary which is arranged to represent a miniature Niagara in the shape of a waterfall 30 feet high, 36 feet in breadth, with a weir depth of

exhibits, the very small chance of effecting sales, and the much smaller employment of minor machinery in English and European shops to what is used in this country, the proportionate foreign exhibit may be considered very creditable.

In the main and much larger building, however, the proportion is reversed, for there the United States exhibit occupies only a little more than one-quarter of the entire area. But then, as an offset to this disparity, the United States occupies the whole of the Government building, 480x360 feet in dimensions, also the shoe and leather dealers' building, in which all that class of our exhibits are made.

In agricultural hall nearly one-half the space is occupied by foreign exhibitors; and in the art gallery fully three-quarters. Hence it will be observed that the average amount of foreign display must not be judged by what is shown in the diagram to-day.

The number of foreign nations represented in machinery hall is 15; in the main building, 30; in agricultural hall, 18, and in the art building, 18. We purpose to give diagrams of each of the above buildings, showing the proportion of area occupied by each nation, and its relative position to all others. These diagrams will be found very convenient, in fact almost indispensable, in forming anything like an accurate conception of the display from any description which can be written.

The Individual Exhibits.

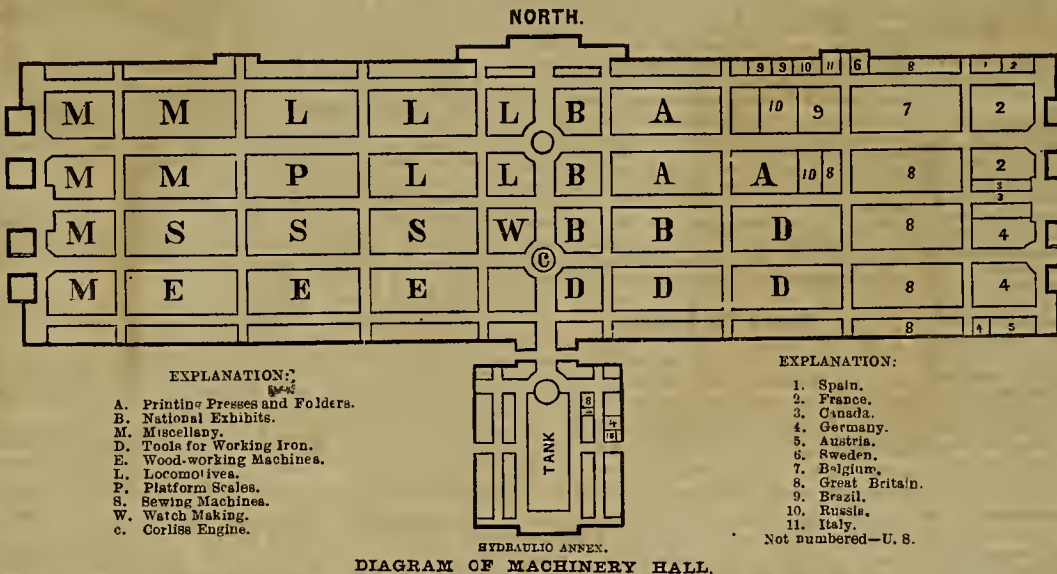
We come now to the individual exhibits, and we will endeavor to give as clear and comprehensive a view of them as possible in the limited space at our disposal. Entering the building by the central entrance at the east, the visitor first encounters the foreign exhibitors, who have very properly been accorded the place of honor in position. The first thing which arrests the attention is the exhibit of our neighbor on the north, France.

Passing a little to the right—keeping our diagram in view—we come to the French section. The machinery consists chiefly in some hydraulic presses not shown in operation, a set of machinery for preparing chocolate and another for manufacturing confectionery in actual work, as is also another near by for cutting and stamping, from sheets, fancy toilet soaps. Both confectionery and soaps are sold to ready buyers, and the proprietors will evidently make their exhibit pay. The heavy exhibits of France consist chiefly in a few forged car and locomotive wheels, shown in sections in process of man-

ufacture, and water pipes covered and protected from decay by a heavy coating of sand and asphaltum. Several machine lithographic presses are also shown in motion, but not doing work. France excels all other countries in producing nice and cheap pictures, and of course she should show how she makes them.

ENORMOUSLY RICH.—We saw some specimens of gold quartz from Melones mine, Carson Hill, Calaveras county, and we confess something like gold fever crept over us. We actually never saw anything like it. It is from a pay streak of $4\frac{1}{2}$ inches in width, and assays about \$100,000 per ton. The balance of the ledge, 25 feet in width, assays from \$50 upwards, all good milling ore, and the depth of 180 feet attained shows that the ledge is a constant one. Gold mining is looking up.

DISSATISFIED STOCKHOLDERS.—Under this heading our daily contemporaries bring notices of a number of meetings held in this city by dissatisfied stockholders. Woodville and the artful manipulations of its manager had almost scared the balance, but Niagara has gained a victory, and a number of others will readily follow. We are afraid that impetuous stock sharps for mine managers will soon be at a discount.



in the government building, near by, where a large amount of machinery has also been placed, that people come most to study. Here is where the thoughtful among them most frequently gather into little companies and with knit brows enter into the careful examination of the peculiar mechanism by which the various and wonderful results of industry and skill are wrought out. Especially is this the case wherever machinery is engaged in "making things," such as watches, curiosities in glass, metallic cartridges, letter envelopes, weaving portraits, rifling gun barrels, turning gun stocks, and by machinery cutting out the ornate and irregular mortices for receiving the locks, casting type by machinery, etc., etc. Perhaps the most marvelous and really useful exhibits in this building are the two great printing press rivals—the English Walter and the American Bullock presses. The great number of spectators observing and carefully studying all these and various other processes demonstrate the little that is known by the average public as to how the various familiar objects of everyday use are made, and yet how eager nearly all are to acquire such information; and it may here be remarked that this kind of interest affords a gratification of quite as high an order, and far more useful than that which comes from viewing and studying the beautiful creations of genius as shown in the art gallery, or the more

four inches, which gives a nearly continuous sheet of water from top to bottom of the fall. This result is produced by a double rotary pump, and forms quite a feature of itself. The annex is 208x210 feet in extent, and is filled almost entirely by pumps, receiving their water from and discharging the same into a large central tank as shown, 106x60 feet in area.

Two railroad tracks are laid the entire length of machinery hall, through the two principal avenues as shown, and one along, just outside the southern wall. These tracks connect directly with the Pennsylvania railroad, and upon them nearly all the ponderous machinery has been introduced into the building, and lifted into place by the aid of two heavy cranes in the English exhibit, which will be noticed in their proper connection.

Relative Proportion of Area Occupied. A close examination of the diagram will enable the reader to form a very accurate idea of the proportionate amount of area occupied by the different nationalities in this hall. The sections designated by figures are occupied by foreign nations, those by letters and those by blank are occupied by the United States. The foreign exhibitors occupy only about one-quarter of the interior space. It was expected that a larger space would have been taken from abroad, but when we consider the distance of transportation and expense involved in such

CORRESPONDENCE.

Some of the Mines of El Dorado County.

[By our own Correspondent—No. 3.]

In my last I stated that some attention would be given to hydraulic, cement and gravel mines lying south of the American river (south fork), in El Dorado county. At Placerville the El Dorado Water and Deep Gravel Mining Company

Have three claims, the Excelsior, Spanish Hill and White Rock, and are running on a vast scale and must be doing a splendid business. The Excelsior alone paid at the last clean-up at the rate of \$1,000 for every ten hours' run. This claim is running six 15-inch Craig giants; main pipe 30 inches and distributing pipes 22 inches and 15 inches respectively. The flumes are four and six feet in width. Mr. F. A. Bishop, the superintendent, has discovered a new system of operating derricks which is now in successful working order at the Excelsior mine. As he will probably take steps to secure a patent, little information, perhaps, ought to be given concerning it at present; this much, however, may be said: that it is likely to prove valuable to the mines of the State. The reel remains fixed while the masts are movable. The company's new ditch is now nearly completed. It is four and one-half feet in width at the bottom, 15 feet on the top, and six feet deep, capable of carrying 5,000 inches of water. It commences at Cedar creek on the south fork of the American river, and is forty miles in length. The number of men usually employed on ditch and mines will probably reach two hundred. The average earnings thus far have been 15½ cents per inch.

Messrs. Goyan & Dickerhoff have been working a cement mine here for at least 15 years, and have done well so far as could be learned.

The Robinson Gravel Claim,

near Smith's flat, employs ordinarily from 40 to 50 men, and has yielded from \$250,000 to \$400,000 within the past five years, according to the best information that could be obtained.

Oak Ranch Claim,

(Lucas, Meyers & Co.), not far from Smith's flat, has been worked for the last 16 months, and has turned out well. The company have two mills of 10 stamps each, one of which has turned out as much as \$1,000 per week. They give employment to about 40 men.

Mr. Blakeley, at the Five Mile house, on the Placerville and Carson City road, is taking out a considerable amount of coarse gold from his hydraulic claim. Mr. Goldner has also commenced work near by with very flattering prospects.

Two or three companies were found at work at Negro hill, engaged principally at present in running prospecting tunnels.

The Park Canal and Mining Co. (Limited)

Have a very valuable property, located near Pleasant Valley, and admirably situated for advantageous working. They have Government title to 160 acres, 92 of which are deep gravel, with a depth of bank from 60 to 250 feet. Character of gravel, elongated and little worn. On bottom are 30 feet of drift corresponding to description of blue lead in Raymond. The gravel pays from 20 cents to \$1.50 per cubic yard; or 20 cents per inch of water used. The tunnel is 280 feet. The ditch to supply mine carries 2,000 inches from Park creek; pressure on pipes 190 feet; outlet over 400 feet; tail flume, 3 feet wide, 800 feet long, with series of damps to break the cement and liberate the gold; employ two Giants and 1,800 feet of 15 inch and 11 inch pipe. The canal department is very extensive, embracing 281 miles, including three main lines and branches. Capacity of main lines 1,500 inches. Canal supplies 2,200 acres of deep gravel ground, the district supplied being between Webber creek and the Cosumnes river, and extending from the Sierras to within 14 miles of Sacramento.

Not less than five quartz mills are supplied from this quarter, water being furnished to miners at 6½ cents for 10 hours, and to ranchmen at 25 cents per inch for season, or at \$10 per acre.

Improvements are now in the course of construction—the details of which must be omitted—estimated to cost \$160,000. At this claim may be seen an improved stop-gate, patented by Mr. J. M. Crawford, through the agency of Dewey & Co. The same may be seen at the Excelsior mine, Placerville, after the designs of Mr. F. A. Bishop, in which, when open, the water forms a continuous stream, and the power or pressure is increased over five per cent.

Hydraulic Mines South of the Cosumnes.

In the vicinity of Fair Play, there is a considerable amount of prospecting going on, and there is a good opening for more capital. Mr. Claybrook, on Bear hill, informed me that his races prospect fully as well as former ones that paid \$15 per day to the man. Mr. Beillecks is also at work here adjoining ground that paid handsomely, not less than \$3,000 having been taken out within two months, with the aid of one or more partners.

The Mansfield Hydraulic Mining and Ditch Co., A. D. Allen, superintendent, are at work in Slug gulch. Their tail race extends through a

tunnel 780 feet long. They own a ditch eight miles in length, the water being taken from the South fork of the Cosumnes, and contemplate extending it five or six miles further to the Middle fork. The full value of this property will probably be determined by another season. Great hopes are entertained here that it will prove remunerative.

A Fact for Science.

Captain Claghoro, a very intelligent miner at Fair Play, informed me that he found in a tunnel, 1,000 feet from the mouth and 200 feet from the surface of the hill, in Slug gulch, a joint-bone of some animal, imbedded in the cement, near the bedrock, with a dozen different strata of cement and pipe-clay overlying. There is a depth of soil above the gravel of at least 100 feet, where a sugar pine is now standing, six feet in diameter. It must have been some time since that animal was drowned in that old river channel.

The Carrie Hall Hydraulic Mining and Water Company's Claim,

Owned by Messrs. Hall, Bradley & Co., is located in Henry's diggings, three miles southwest of Grizzly flat, occupies an area of 250 acres, and is admirably situated for any amount of desired fall, not far from the Middle fork of the Cosumnes. They own a ditch eight miles in length. Over \$1,000,000 has been taken out of the gulches running into the hill where they are at work.

M. E. Hall, superintendent, contemplates running a drift into the hill with the view of prospecting the channel, having already reached the rim, and from all the surroundings has every reason to hope for a rich return for the amount expended.

Mr. Richardson is opening a claim at French flat, near Indian diggings, and is developing a fine body of gravel which is exceedingly promising. The largest operations in this kind of mining in Cosumnes township were found at Indian diggings. Mr. Murry has been at work here for the past ten years with a small hose, and has made it profitable. His facilities being now greatly increased, his prospects for a more ample yield are said to be excellent. Messrs. Brinrowes and Pack have been working here for some time on a small scale, with good returns. They have taken out with a common hydraulic hose, one and a half inch nozzle, using only 75 inches of water, as high as \$1,450 in a single month.

The Cedarville Water and Gravel Mining Company's Claim

At this place covers an area of 350 acres, and is looked upon as a very valuable piece of mining ground. There is ample dump room for all time to come. They are running two little giants under pressure of 300 feet. They use about 1,000 inches of water. The flumes are three feet by two feet in the clear, having a fall of one-half inch to the foot. The claim has been prospected, as I was informed by the superintendent, by six different tunnels. One of these has been extended into the hill 1,800 feet, showing a bed of gravel 108 feet deep, paying 75 cents per cubic yard, as drifted out. They are now running with flumes to reach the same deposit prospected by the tunnel. Here we noticed a large lamp manufactured by Messrs. Brittan, Holbrook & Co., of your city, that lights a bank 200 feet high and 300 feet ahead, enabling the men to work continuously for 24 hours.

When I reach Georgetown you will probably hear something of the quartz, gravel and porphyry claims lying between the south and middle forks of the American river. K.

Beyond the Sierras.

Editors Press:—One of the most beautiful valleys in the world is that where I now rest. It is walked on either hand by the Sierra Nevada on the west and the Inyo mountains on the east, and in some places appears completely girdled by these two great chains. It is, in itself, a high table land, having been ascertained by exact measurement to be 4,340 feet above the sea, while the higher peaks are nearly 11,000 feet. The grand effect of these snowy summits, standing as they do against the deep blue that might rival in clearness the famed Syrian skies, can hardly be imagined. As we gaze into their depths, shadowy caves, sparry grottoes and crystal halls open to the sight, and we wander away through scenes of unimaginable peace and beauty. Indeed, the mountain scenery of this region could not well be surpassed.

The valley itself is about 100 miles long, and from 10 to 15 wide, and is watered in its whole extent by Owen's river, a very winding stream, with a deep and narrow channel, that carries water enough through the year, if properly distributed, to irrigate the whole valley. This stream is said to bear a striking resemblance to the Jordan, while Owen's lake, into which it empties, is in some of its characters like the Dead sea, for it has no visible outlet and contains no fish. Indeed, the general character of the scenery would remind the traveler of Palestine or the Holy Land, but the lively little steamer that plies on the lake gives to the scene a modern, familiar look.

A few miles from the lower end of the lake is Lone Pine, which, it will be remembered, suffered much by the great earthquake of 1872.

It is now the depot where the business interests of the neighboring mines are chiefly transacted. The village is spread over a great deal of ground and has an excellent hotel, kept by Mrs. Eames, whose refined manners and womanly kindness will not soon be forgotten. Here it may be said that the Cerro Gordo mines, about 20 miles east of Lone Pine, which for the last 18 months have been lying idle on account of litigation, are now running, with two furnaces in full operation, and under the new corporation they will probably double their products within a year.

A morning ride of 16 miles through a vast level of sage brush, with here and there, as there might be almost everywhere, fine ranches, we arrive at Independence, the seat of Inyo county. Though only nine years old, this little town has already some marked advantages, among which are the Blaney hotel, which, in the general good taste of its appointments and the excellence and variety of its viands, may compete with our best city hotels, and a weekly paper, that ably represents the character, wants and mental caliber of the county itself. I have seen few better country papers, for though small in size it covers a wide field of observation and thought.

The Kearsarge mine, which has been lying still for five years, is in this vicinity. New operations are in progress; and the Eclipse mine, on the Inyo side of the river, is now being worked with a 30-stamp mill on gold ore. The Inyo range on the east side of the valley has the appearance of one vast body of mineral, and must ere long develop a vast accumulation of wealth, such as cannot be found in California. In fact, the mineral wealth of this county is rapidly developing, and at no very distant day it will show itself second to none other.

Again taking the stage at four A. M., we have a ride of 40 miles further, and arrive about noon at Bishop Creek, a cluster of half a dozen houses, situated on the stream whose name it bears. Then a little ride of two miles more, and we are released of our wayfaring for the present. The new home is a picturesque little cottage, nestling close by the side of a prattling brook, born of the pure mountain crystal, overshadowed by beautiful trees that might well vie with the classic groves of Acadamus.

At another time I may give you some account of the natives, and the agricultural resources of the valley, but here for the present I rest, and here I work, to unfold great powers and purposes yet unknown.

FRANCIS H. McDUGALL.

Owen's Valley, May 24th, 1876.

Mineral Exhibition at the Centennial.

We take the following from a letter to the *Gold News* of June 8th: The mineral exhibition at the Centennial is well represented by four departments. First and best is the Lake Superior copper and silver. Next comes Chile, a very fine assortment of minerals and ores. Next comes Nevada and California, showing a magnificent selection of rich gold and silver ores, etc., the best portion being collected by Messrs. H. R. Whitehill and W. Frank Stewart, of Nevada. Next comes Mexico with some fine ore and mineral specimens, and one piece of silver and lead bullion, one quarter lead and the balance silver; weight, 4,002 ounces. It measures about 18 inches through. Next comes the Nevada mill, under the management of Hon. C. C. Stevenson. This is well represented, and the State of Nevada may well be proud of it. It has five stamps, runs well and is now working Belcher and Ophir rock. There is also Consolidated Virginia ore at the mill. Fine as these works are, however, people do not call there much, and to bring our mineral resources before the world properly could be better accomplished if Messrs. John Mackay and Col. Fair would bring here 20 tons or two carloads of bullion bars. This would take the premium and give credit to our State of Nevada; otherwise Lake Superior and Chile will have the best of it.

The Nevada quartz mill, and those mining tools from the Belcher mine are attracting a great deal of attention, and the general arrangements of this have been admirably carried out, reflecting great credit upon Hon. C. C. Stevenson and Mr. Smith, superintendent of the Belcher.

A METAL MORE FUSIBLE THAN TALLOW.—M. Lecoq de Boisbaudran, whose recent discovery of the new element gallium, and whose subsequent researches thereon we have from time to time noted, has recently, for the first time, succeeded in obtaining a grain and a half of the metal in a pure state. This has enabled him to determine the remarkable fact that gallium melts at 85.1 deg. Fah., so that it liquefies when held in the hand. When solid, the metal is hard and resistant, even to a few degrees below the melting point. It can be cut, and possesses a slight malleability. When fused, it adheres easily to glass, on which it forms a beautiful mirror, whiter than that produced by mercury. It oxidizes but very superficially when heated to redness in the air, and does not become volatile. The density at 59 deg. Fah. is 4.7, that of water at 39.2 deg. Fah. being 1. Exceeding mercury, which only becomes solid at -37.9 deg. Fah., there is no other element which liquefies at so low a temperature as gallium. Fusible alloy of one part lead, one part tin and one part bismuth, melts at 201 deg., and phosphorus at 111.5 deg. Wax and tallow have melting points respectively at 142 deg. and 92 deg. Fah.

Quicksilver.

The course of the quicksilver market has been very different this year from last, when it was subject to a number of disturbing influences. The greatest of these was the sudden and enormous increase in the production of California. It seemed doubtful for a time if the world's consumption was great enough to absorb all this surplus, except at very low prices; but, during the latter half of 1875, it was very clearly shown that between California and Nevada on the one hand, and China, Australia, Mexico and the South American republics on the other, an American production not exceeding 40,000 flasks, in addition to a Mexican production of 2,200 flasks, could be maintained without oversupplying the market. This would leave for consumers in the Atlantic ports the 48,000 flasks produced in Europe and the 2,000 received by Holland from Borneo.

This year the quicksilver market has been remarkably quiet, on the basis of £10 at London, 58c. to 59c., gold, at San Francisco, and 61c. to 62c., gold, in this market; yet there is probably as much reason for an unsettling of values this year as last. Official statistics thus far received from California show that the production in that State is again considerably increasing, and, in addition, we have intelligence of important discoveries of new deposits at Reno, Nevada. During the first six weeks of the current year there were exported from San Francisco 4,726 flasks, against 1,342 flasks exported during the same period last year. The bulk of this large shipment was sent to China, which seems to be capable of taking almost unlimited quantities at reasonable prices.

We have, however, no means of judging what may happen in that country in the course of the next few months, or what will be the result of the demonstration now making in that quarter by England, Russia and Germany. This may lead to a temporary blockade of the trade ports, causing a sudden check in the shipment of quicksilver to China; but were this event to occur, the increase in the silver product of Nevada, requiring increased quantities of quicksilver, may suffice to prevent a glut of that metal at San Francisco. In 1875 the Consolidated Virginia mining company reduced no less than 169,094 tons of silver ore, representing a value of \$17,209,733, and there was a large reserve of ore on hand at the beginning of this year, with a melting and assaying capacity of \$5,000,000 bullion per month. In Mexico, on the other hand, silver production is hampered by revolutionary disturbances, and less quicksilver will be required to supply the demands of that market than would be needed in times of peace.

The following are the official statistics of quicksilver exports from California, by sea, during the three years ended with 1875:

To	1872.	1873.	1874.	1875.
	Flasks.	Flasks.	Flasks.	Flasks.
New York.....	1,202	...	315	287
On shore.....	4,810	1,900	1,000	18,190
Mexico.....	5,038	3,761	4,104	5,757
South America.....	1,300	508	738	2,149
Australia.....	643	105	100	832
British Columbia.....	2	11	2	17
Other countries.....	103	74	311	1,728
	13,098	6,339	6,770	28,960

At 76½ each, lbs. 1,002,075 476,463 517,905 2,215,440

The following figures show the quicksilver movement in Great Britain:

QUICKSILVER MOVEMENT IN ENGLAND.

	1876.	1875.	Pounds.
Imp. from Jan. 4 to March 31.	1,251,682	1,104,522	979,580
Exports.....	149,421	208,892	676,080

Quantity retained..... 702,261 895,670 403,900

These English statistics, which are brought down to a very recent date, show that considerable quantities of quicksilver have moved through Great Britain, the bulk of which is received from Spain by the Rothschilds. From London, most of it finds its way back to the Continent. The average monthly distribution of quicksilver in Great Britain is usually set down at 3,500 flasks, or 267,750 lbs., for home use and export. For three months this would have amounted to 803,250 lbs., whereas it has been 1,251,682 lbs., showing that at prevailing low prices the distribution is largely on the increase in that part of the world. Last year fluctuations in prices were largely determined by momentary aspects of production. This year it seems to be exclusively a question of consumption. If China and Mexico are able to take as much this year as they did in 1875, even an increase of 10,000 flasks in the production of California is not likely to depress much, if any, the value of the metal, owing to the enormous expansion of the silver mining interest in Nevada.—*Iron Age*.

NEW MODE OF DECORATION.—The well known French earthenware manufacturer, M. Emile Collinet, has just discovered a new mode of decoration for private dwellings and public buildings. Instead of applying the decorated faience to the wall, he proposes enameling the stone itself, by putting up a light scaffolding and using the blowpipe instead of the oven. The advantages of the scheme are principally cheapness and durability. The experiments tried show that the process is less expensive than separate plates, and the decoration is calculated to last as long as the stone itself. The architect of the Louvre, M. Lafuel, has given his entire approbation to the process, and means to take the first opportunity of applying it under the inventor's superintendence.

SCIENTIFIC PROGRESS.

Micro-Photographs of Blood.

At the Massachusetts Institute of Technology, Dr. Cutter exhibited micro photographs of the blood of man and of some of the higher animals, taken by himself. His object was to ascertain what ground, if any, medical experts had for saying that they could distinguish the blood of a child from that of an adult, or that of a man from any other mammal. He had such photographs taken by the aid of a microscope, transferred to glass positives, and then thrown on a screen with the calcium light. The images can thus be measured either directly or by the eye, and any observer, not a microscopist, can determine for himself whether such discrimination is possible, as size is the only morphological element of the red blood corpuscle taken into account by such experts.

He exhibited the blood of man, rat, dog, pig, ox, deer, squirrel, sheep, horse, mouse, cat, rabbit, frog and trout—all taken with the same 1-50 objective, at a distance of twenty-six inches, and reduced upon the glass positives at the same distance from the camera.

Before showing the pictures he described the manner of taking them, as to articles employed, objectives, stand, slides, camera, and position of the various parts of the apparatus, and also the difficulties arising from the shaking of the building by the travel in the street, from focusing, and the arrangement of the light.

The averages of the measurements were as follows:

Man.....	1-3100	to 1-3200	of an inch.
Dog.....	1-3200	"	"
Squirrel.....	1-3600	"	"
Rat and Rabbit.....	1-3400	"	"
Deer.....	1-3900	"	"
Ox.....	1-3900	"	"
Pig.....	1-4028	"	"
Horse.....	1-4200	"	"
Sheep.....	1-5600	"	"

Other observers differ from the above measurements of Dr. Harriman, but always in a slight degree; and Dr. Woodward could not find any difference between those of man and the dog. Whether such small differences could be of any value in legal medicine he left for his audience to determine, showing, as he did, that in the same specimen the size varies considerably, and that, familiar as he was with the appearances, he could not at a glance distinguish them. He also exhibited the appearance presented by diseased blood in the various stages of consumption, showing very interesting and characteristic changes in the outlines, appearance and contents of the globules.

Animal Parasites.

Professor Van Beneden, of the University of Louvain, France, has recently written an interesting little work entitled "Animal Parasites and Messmates," in which he has contrived to compress a great deal of curious information regarding a subject much more extended than the reader not versed in modern progress of natural history would suppose. There is a fish, he tells us, called the *holothuria*, which is a living hoarding house for the *pierser*, an eel-like animal. The latter is lodged in the digestive tube of his companion, and, without any regard for the hospitality which he receives, seizes on his portion of all that enters. The angler or *beudroie* of the Mediterranean often harbors, in the bronchial sac, a kind of eel, which is abundantly able to take care of itself, but prefers to live a life of idleness and share its host's spoils. The eel is accompanied by the pilot fish, which does not, as is often reported, exist on the leavings of his larger companion, but on his own industry, and doubtless finds some advantage in piloting his neighbor.

Another remarkable fish, the *remora*, literally moors itself to the body of the shark, thus converting the latter into a vehicle, which carries him about without exertion on his part. When he becomes hungry he lets go, and hunts for prey wherever he may happen to be. The tenacity of the remora in attaching itself is taken advantage of by the fishermen of Mozambique channel, in order to capture turtle and large fish. They pass through the tail of the remora a ring to which a cord is attached, and then send it in pursuit of the first passer-by which they consider worthy to be caught. The fish holds on to its prey so firmly that it only remains to haul victim and captor in by the line.

There is a crab, of the family of *maidea*, which conceals itself in the substance of a polypoid; it is common in the Viti islands, in company with a gastropod mollusc, and both of them assume the exact color of the polypoid. This is a new kind of mimicry. Another crab appropriates a real anemone to form a living cloak to hide it from view, in order that it may spring out from its ambush to attack prey. Remarkable marine creatures are the *birgi*, a kind of crustacean, which grow very large, and conceal their abdomens no longer in a shell, but in the crevices of rocks. In the East Indies they remain on land and even climb trees. They have so much strength in their pinners that it is related that one, while stretched on the branch of a tree, "raised a goat by the ears." A family of isopods are rather dangerous messmates, it would seem, for they cut into the walls of their host's stomach and live like *Sybarites* on its contents.

The most interesting fixed messmates are the chirripedes, which cover the skin of whales,

which they never quit after once choosing its abode. Each whale lodges a peculiar species, so that the crustacean messmate is a true flag, which indicates in some respects the nationality. It would not be without interest for voyagers who are naturalists to study these living flags.

Among the mutualists may be mentioned the ticks, one generic species of which has 20 species, one of which lives on the dog, another on the cat, and another on the ox. Fishes harbor crustaceans instead of ticks, and these sometimes multiply so rapidly that they cover their hosts as though they took the place of scales. The cod gives lodging to a species of very beautiful shape, which in its turn affords a resting place for a still smaller organism. In the midst of the eggs of the lobster there lives an animal of extreme agility, which our author considers the most extraordinary being ever subjected to the eyes of a zoologist.

There is no organ which is sheltered from the invasion of parasites; even in man, *cysticerci* have been found in the interior of the lobes of the brain, in the eyeball, in the heart, and in the substance of the bones, as well as in the spinal marrow. Each kind of worm has also its favorite place; and if it has not the chance of getting there, in order to undergo its changes, it will perish rather than emigrate to a situation which is not suitable to it. One kind of worm inhibits the digestive passages; another occupies the fossa of the nose; a third, the liver or the kidneys. Each animal has its proper parasites, which can only live in animals, having affinity to their peculiar host. Thus the *ascaris mystax*, the guest of the domestic cat, lives in different species of *felis*, while the fox, so nearly resembling in appearance the wolf and the dog, never entertains the *tania serrata*, so common to the latter animal. The same host does not always harbor the same worms in different regions of the globe. Thus the large tapeworm of man, *bothriocephalus*, is found only in Russia, Poland and Switzerland; a small tapeworm, *tania nana*, is observed nowhere except in Abyssinia, and, strange to say, the natives consider their absence from the body a sign of ill-health; the *anchylostoma* is known only in the south of Europe and the north of Africa, the *filaria* of Medina in the east end west of Africa; and the *Bilharzia*, a terrible worm, has been found only in Egypt.

Alarm Against Suffocation by Gas.

Burglar alarms have come into extended use, in this country at least, and to them have been added fire alarms, to go off when a certain temperature is reached; and it has been suggested that a suitable alarm for coal gas from leaky stoves could be added, making use of the property that carbonic oxide possesses of precipitating palladium salts. Another modification has been invented by Aysel, for detecting the escape of street gas in a room. It possesses the advantage of simplicity, and its operations depend on a physical law, not a chemical one, namely, that the lighter a gas is the more rapidly it diffuses through a porous membrane.

The apparatus consists of a pear-shaped vessel covered with a porous membrane or unglazed earthen plate. This vessel has attached to it a U-shaped tube filled with mercury. One pole of the battery dips into the mercury, the other terminates just above the surface of the mercury in the open end of the tube. If this apparatus is placed in a room where coal gas is escaping, the gas enters through the porous plate more rapidly than the air can escape; a certain pressure is produced, which causes the mercury to rise in the open leg and complete the circuit, thus giving the alarm. It is said that a comparatively small amount of gas in a room will set the apparatus in motion. A similar apparatus with the opposite arrangement of the terminating wires could be employed for detecting a large escape of carbonic acid from any source, for this gas is so heavy as to at once produce a partial vacuum in the pear-shaped vessel, and, of course, a fall of mercury in the open leg. The amount of carbonic acid requisite to vitiate an atmosphere is, however, so small that it would probably be without effect on this instrument. There may be other cases where the pressure of gases much heavier or lighter than air could be detected more quickly by this than by the ordinary methods, as in coal mines and wells; while an advantage is that signals may be automatically conveyed to any desired distance. This seems, at least, a promising field for inventive genius and research.—*Scientific American*.

Germs.

In an interesting article on spontaneous generation, by Rev. W. H. Dallinger, published in the *Popular Science Review*, he shows that the germs of bacteria and monads may be so infinitesimal as not to be revealed by the microscope, and only by means of physical processes such as were instituted by Professor Tyndall, who "has presented us with a physical demonstration of the existence of immeasurably minute molecules of matter, utterly beyond the reach of the most powerful combination of lenses yet constructed, which are the indispensable precursors of bacteria in sterilized infusions. In short, he has opened up a new and exact method which must lead to a scientific determination of the existence and nature of the bacteria germs. The particles which Tyndall was enabled to detect by passing a beam of light through them Mr. Dallinger was unable to detect with an exquisite one-fiftieth objective, employed with a new and delicate mode of illumination for high powers and worked up to 15,000 diameters. After demolishing Dr. Bee-

man, he thus sums up what he regards as the facts concerning the theory of spontaneous generation: (1) Dr. Tyndall has proved, in connection with a host of others, but in a more definite and precise manner, that in filtered infusions five minutes' boiling does kill every form of bacteria; (2) he has further shown that they are propagated by demonstrable germs only in such infusions; and (3) this fact removes the probability of their spontaneous generation to an almost infinite distance. He says:

"As to the development of bacteria in infusions charged with solid matter, precise experiment of a sufficiently comprehensive character has yet to be made on them in relation to the demonstrated germs. Meantime, shall we accept 'spontaneous generation' on such ground as its strongest advocate has now to offer, and ignore the vast chain of facts, copiously attested and controlled, which are in perfect harmony with the known laws of the entire organic world? This, and nothing less than this, is what Dr. Bastian inculcates and demands."

MECHANICAL PROGRESS.

Accurate Measurements.

How much of good workmanship depends upon accurate measurement. The skilled mechanic who never fails of a fit knows that his strength lies in his rule or his calipers and his knowledge and care in using them. But how many have thought how accurate a measurement must be to be true to the perfection of mechanism. We find by our English exchanges that at the last Kensington exhibition of scientific and mechanical apparatus there was a discussion on the value of accurate measurements, from which we draw several interesting points:

Dr. C. William Siemens, in his opening address, dwelt upon the value of accurate measurement as the most important aid to discovery. To know was to measure. The Egyptians used the power of steam to work such pretended miracles as that of the spontaneous opening of the doors of the temple whenever the burnt offering was accepted by the gods—or, as the moderns would put it, whenever the steam generated by combustion was sufficient to produce steam in the hollow body of the altar, and thus force water into buckets whose increasing weight caused the gates to open. Unfortunately for them, the Academia del Cimento of Florence had not yet presented the world with the thermometer, nor had Torricelli shown how to measure elastic pressure; or there would have been, at all events, a probability of their applying the power of steam for transporting the materials and raising the water in their elaborate works of irrigation. After speaking of several other kinds of measurement, the President passed to the measurement of heat. The principal instrument here employed is, he remarked, the thermometer. He would not speak of the different scales adapted by Reaumur, Celsius and Fahrenheit, which were based upon no natural law nor zero points in nature, and were, therefore, equally objectionable upon theoretical grounds. Would it not be possible to substitute for these a natural thermometric scale? Was it not possible to adopt one commencing from the absolute zero, of the possible existence of which we have many irrefutable proofs, though we may never be able to reach it by actual experiment?

Sir J. Whitworth read a paper on linear measurement, in which he compared line with end measure to the disadvantage of the former mode of ascertaining length. In illustration of the advance made in accurate measurement, he said that 50 years ago the thousands of spindles in a cotton factory had each to be separately fitted into the holster in which it worked. At the present time all these spindles are made to gauge and are interchangeable. The foundation of accuracy in measurement is, he said, the production of the true plane, and he exhibited planes such as are produced in the workshops of his company. The millionth measuring machine Sir J. Whitworth did not exhibit, but he performed a sufficiently striking experiment with one of his gauges. He passed a pencil between the two points. Then he advanced one of these two points a little nearer to the other, just one twenty-thousandth of an inch. The breadth of the pencil was thus ascertained within one twenty-thousandth of an inch.

In the course of the discussion which followed, M. Treaca said they wanted to ascertain thickness equal to one-thirtieth of the breadth of a cobweb.

Mr. Chisholm, warden of the standards, recommended linear measurement, on the authority of the careful investigations of the commissioners of the standards, and by other arguments, and the President thought that linear measurement was applicable to long distances, and end measurements to small differences and small pieces.

Sir J. Whitworth, in his reply, said that the commissioners of the standards, men of great scientific attainments, had not the experience of the workshop (they did not know how to use their hands), and in proof of this, he said they represented the standard-yard by a piece of bronze of a certain length at a temperature of

62 deg. But the temperature of the human body was such that you could not touch anything at 62 deg. without raising its temperature and so causing expansion, and he himself proposed that the standards should be made and kept in a room at a uniform temperature of 85 degrees.

Mr. Merrifield, F. R. S., spoke upon solid measurement, explaining, among other instruments, Amies's planimeter, and several rough-and-ready means of finding the contents of casks; etc., for fiscal purposes. He then described a more accurate means of performing those tests—Dr. Werner Siemens's alcoholometer, which has been in use in Russia for four or five years, and is said to have added 25 per cent. to the receipts of the Russian government from the duty upon spirits made in the country. All the spirit made in a distillery is conducted from the condenser by pipes, which are exposed throughout, so as not to be capable of illicit tapping, to this instrument; and, in the passing through, the total amount of spirit and also the amount of alcohol in the spirit are recorded by counters, which may be inspected, from month to month, or oftener. The instrument is enclosed in a strong iron case.

In the afternoon, Sir William Thomson gave a historical account of electric measurement. The manuscripts of Cavendish, he said, would be found of the greatest interest, a whole branch of electric measurement, the measurement of electro-static capacity, being worked at in them. The manuscript had been preserved in the family of the Duke of Devonshire, and had now been placed in the Cavendish laboratory at Cambridge, under the charge of Professor Clerk Maxwell, by whom they would be edited. Electrical measurement was now so advanced that there was no reason why Leyden jars should not be labeled, as a matter of course, "the capacity of this jar is so many centimeters."

Subterranean Telegraph Joints.

At a meeting of the Society of Telegraph Engineers, a paper by Willoughby Smith was read on the "Formation of Joints in Gutta-percha Covered Wire for Subterranean and other Telegraph Lines." The author has given careful attention to the subject, and had at length succeeded in inventing what he had no doubt would prove a simple, cheap and efficient mode of dealing with one of the practical difficulties of subterranean telegraphy. The new joint is formed by removing the coatings from the two ends to be united and joining the cleaned wires by what is technically known as the "bell hanger's twist." No solder is necessary. The twist is then wormed slightly and covered with a rough coating of insulating compound, somewhat thicker than the original diameter of the wire. The joint while warm is placed in the lower half of a small wooden block about three inches long and one inch wide, fitted internally with a groove for the wire, widening in the middle into a notch about one and a half inches in length for the reception of the compound covered joint. While the compound is yet warm the upper half of the mold—in shape corresponding exactly with the lower one—is placed on the top, and, by means of a clamp, screwed down until the two wooden surfaces are pressed firmly together. While in this position they are permanently fixed by half a dozen ordinary brass screws, and the compound having hardened, the clamp is removed and the joint complete. The cavity in the interior of the block in which the copper ends meet being completely filled with compound, the insulation is all that could be desired, numerous experiments carried out by the author having satisfactorily tested the electrical qualities of the arrangement. The cost is thus reduced to a very low figure, and by means of the wooden covering all danger of "leakage" or separation of the wires through bending is obviated. The joint was not of course applicable except in cases of emergency, to sub-marine cables, but as far as the author could judge was all that could be desired for the purposes for which it had been designed.

The First Railway in China.

A little railway is being laid down between Shanghai and Woosung, a town at the junction of the river Hwang-poo, (on which Shanghai is situated) with the Yangtze. The distance is only nine miles, but the great object is to establish a railway of some kind on Chinese soil, in order to show the people what it is like. The land was quietly bought up by a few foreign merchants, the roadway levelled, and a company subsequently formed to carry out the undertaking. A large portion of the required capital was subscribed in England, and the remainder in Shanghai. The mandarin have been all along jealous of the proceedings of the company, and are doing their best to embarrass it, but the rest are perfectly well disposed. They often come to look at it, and only yesterday (says a Shanghai correspondent of the *Times*, writing on March 23d), several very respectably dressed Chiese who had come for the purpose were invited to ride in the ballast-trucks. They were a little timid at first, but eventually accepted the offer and were delighted with the experience. The engine which is being used is only of two or three horse power, and hardly bigger than a good sized Newfoundland dog. The Chinese are employing an English engineer, Mr. Tyeck, and English machinery, in an experimental opening up of the coal mines of Kelung, North Formosa.

Compiled every Thureday from Advertisements in the Mining and Scientific Press and other S. F. Journals.]

Company.	Location.	No.	Amt.	Levied.	Delinq't.	Sale.	Secretary.	Place of Business.
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Company.	Location.	No.	Amt.	Levied.	Delinq't.	Sale.	Secretary.	Place of Business.
Adams Hill Co M Co	Enreka Nav	7	75	May 2	June 12	July 7	W W Traylor	369 Montgomery e
Cosopolitan M Co	Nev	3	25	May 1	June 5	June 23	M Sander	307 Montgomery e
Crown Point G & S M Co	Nev	26	100	June 13	July 18	Aug 8	Chas E Elliott	419 California s
Eureka Co M Co	Nev	2	1 60	May 26	June 30	July 20	W W Traylor	209 Montgomery e
Florida Dairy S M Co	Washoe	50	26	May 26	June 21	July 12	A D Kuthrow	369 Montgomery e
Hale & Norcross S M Co	Washoe	50	1 54	May 16	June 21	July 12	F Nevada	419 California s
Kosuth M Co	Washoe	6	50	May 23	June 29	July 29	E F Stone	414 California st
Ledy Bryan M Co	Washoe	12	75	May 26	June 28	July 19	W H McClintock	413 California st
Leviathan M Co	Nev	3	50	May 19	June 20	July 11	F E Lundy	807 Montg mery e
Marble Valley M Co	Ely District	11	20	Apr 21	June 22	June 22	W Colburn	418 California st
Mint G & S M Co	Ely District	13	20	Apr 21	May 29	June 29	D J Wallace	419 California st
Newark S M Co	Ely District	12	50	May 16	June 20	July 11	Wm Willis	309 Montgomery e
N Con Virginia M Co	Nev	3	25	June 3	July 7	July 7	J Maguire	419 California st
Niagara G & S M Co	Nev	2	15	June 12	July 13	Aug 1	W R Townsend	Nevada Block
Plum Schermer & S M Co	Washoe	4	75	May 13	June 20	July 20	R R Townsend	Nevada Block
Portman G & S M Co	Idaho	6	40	May 19	June 23	July 19	W Willis	309 Montgomery e
Prospect G & S M Co	Washoe	1	1 00	Apr 24	May 29	June 19	J P Moore	3 03 Sacramento
Savage M Co	Washoe	24	2 00	May 31	July 6	July 25	R B Holmes	309 Montgomery e
Sierra Nevada S M Co	Nev	44	2 40	May 23	June 26	July 14	W W Steison	309 Montgomery e
South Harriet M Co	Idaho	17	30	May 8	July 5	July 27	W H McClintock	419 California st
South Comstock G & S M Co	Washoe	4	40	May 8	June 28	July 28	M Livingston	3 03 California st
Star King S M Co	Nev	13	10	May 1	June 29	June 29	L Kaplan	Merchants Bldg

Amador Con M Co	Nev	8	10	Apr 21	May 27	June 17	J M Buffington	311 California st
Black Hawk Coal M Co	Cal		5	Mar 18	May 20	July 8	H A Powell	520 Montgomery

WED'SDAY, A.M. JUNE 14.	240 N Con Vir.	150
500 Alpha.	455 N. Carolina.	150
400 Best & Belcher.	400 North Caron.	200
400 Hedges.	435 Oubir.	82-55-35
400 Confidence.	150 Prussian.	26
235 Crown Point.	400 Red.	26
400 Con Imperial.	225 P. Plect.	17-20-20
1250 Con Imperial.	60 Prospect.	7
90 Chollar.	60 Rock Island.	10
1245 California.	300 Rock Island.	10
400 Chas. W. Adams.	80 South Carlot.	250
450 Dancy.	40 Silver Hill.	10-7
415 Eschequer.	150 Sledge.	15-12
450 G. and Onry.	300 Sh.	10
405 G. and Onry.	150 Trojan.	20
405 G. and Onry.	450 Virgin A.	24-20-20
8-5 Jus. C. Norton.	400 Wall.	10-20-20
14 Julia.	60 Wall-Narzu.	12-20-20
135 Kentuck.	40 Ward.	150
	620 Yellow Jacket.	30-20-20
SALES OF LAST WEEK AND THIS COMPARED		
THURSDAY A.M. JUNE 8.	THURSDAY A.M. JUNE 15.	
195 Alpha.	655 Alpha.	500

Name of Co.	Location.	Secretary.	Office in S. F.	Meeting.	Date.
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Name of Co.	Location.	Secretary.	Office in S. F.	Amount.	Payable
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145 S vava	17½@17½	665 Un Con.....	10½@10
10 Silver Hill.....	}	3 S Virginia.....	2¼
95 Sierra Nevada		13¼@13¼	210 Woodville

3000	California.....	8 1/4	25	Belmont.....	17 1/2
2100	City of B. ston.....	8 1/4	20	B. Lhar.....	17 1/2
20	Crown Point.....	12	30	Con Reforma.....	37 1/2

390 Utah.....	24@2	55 Ward.....	29@2
390 Union Con.....	11@1	340 Y Jacket.....	29@29
50 Wells-Fargo.....	35		
10 Ward.....	10		
815 Yellow Jacket.....	3@33		
AFTERNOON SESSION.		AFTERNOON SESSION.	
525 Belmont.....	24@2	50 Alps.....	14
350 Cose Con.....	2-	154 Alpha.....	50@50
520 Eureka Con.....	10@1@0	50 B.....	24@4
2 Cn Thomas.....	17	250 Bct & Bell.....	35@35
410 Golden Chariot.....	12	120 Bel her.....	16
75 Hussey.....	56@90	71 California.....	14@15
389 Imperial Con.....	6@66	130 Crown Point.....	10@10
100 Jackson.....	35@10	230 Cn Thomas.....	35@35
35 Julia.....	15@10	500 Cn Imperial.....	5
100 Jefferson.....	10	120 Eureka Con.....	11@11
800 Kentucky.....	124	300 Cn Thomas.....	25@25
40 Leonard.....	6@68	230 Cn Chariot.....	35@35
52 Meadow Valley.....	12	500 Hussey.....	50
50 Mexican.....	37	30 H & Norcross.....	612
75 Northern Bella.....	40@48	100 Jefferson.....	514
210 Ophir.....	55@62	50 Justice.....	22
350 Footman.....	15@15	500 Justice.....	35@35
50 Panhar.....	15@15	5 Leopold.....	74@74
60 Raymond & Ely.....	9	100 Mc oc.....	3
10 Sierra Nevada.....	19	155 Meadow Valley.....	12@12
50 Union.....	11@11	180 Mexican.....	27
50 Union Jacket.....	33@33	2 Newark.....	20
120 Yellow Jacket.....	33@33	90 New Coso.....	14
		25 Overman.....	34
		180 Ophir.....	31@31
		800 Russian.....	15
		870 Panhar.....	13
		100 Poorman.....	12@12
		35 Ray & Ely.....	35
		270 S vae.....	10
		100 Thyo.....	114
		40 Union Con.....	104
		1515 Yellow Jacket.....	30@30

100 Twin Peaks.....134	10 Mexican.....29 1/8	COPPER-
90 Union Con.....10 1/2	100 Monmetal.....20 1/8	Breziers'.....- 37 1/2 @ -

Cal. Board—Latest Sales.

EDN'S DAY, A. M., JUNE 14	290 S Ophir.....	1
09 Amazon.....	70 Savoca.....	1
50 Am Flat.....	70	
30 Alpha.....	51 1/2 55 1/2	
0 Andes.....	2 1/2	
00 Alameda.....	18 1/2 17 1/2	
5 B'char.....	18 1/2 17 1/2	
75 B's & Bel.....	5	
00 Crown Point E.....	10	
100 C. D. I.....	20	
00 C. J. I.....	20	
00 C. M. I.....	27 1/2 28 1/2	
300 Coo Virginia.....	63 1/2 65 1/2	
20 Chollar.....	8 1/2	
00 Chollar.....	8 1/2	
00 Chollar.....	8 1/2	
00 Crown Point.....	11 1/2 11 1/2	
00 Erie Con.....	1	
10 Exchequer.....	17 1/2	
00 F. M. I.....	19	
75 Justice.....	1	
55 Julia.....	93 1/2 95 1/2	
00 Leviathan.....	30	
00 Andy Wash.....	2 1/2	
40 Meadow Valley.....	13 1/2 15 1/2	
50 Monumental.....	50	
45 Mexican.....	23 1/2 25 1/2	
00 New Hope.....	11 1/2	
00 Nevada.....	35	
0 N Sierra Nevada.....	15 1/2	
00 Ophir.....	15	
50 Phil.....	52 1/2 55 1/2	
00 Phil Sheridan.....	37 1/2	
290 S Ophir.....	1	
70 Savoca.....	1	
300 S Barcelona.....	13 1/2 15 1/2	
10 Union Con.....	10 1/2	
1900 Valley-Fargo.....	12 1/2 15 1/2	
123 Woodville.....	7 1/2 10 1/2	

AFTERNOON SESSION.

25 Alps.....	11 1/2
100 Alameda.....	65 1/2
10 California.....	1
10 Con Virginia.....	6 1/2
90 Crown Point.....	11 1/2 13 1/2
100 C. D. I.....	6 1/2
150 Con Alameda.....	1
800 Fly.....	23 1/2 25 1/2
150 Gila.....	75
100 Gila.....	75
950 International.....	1
70 Julia.....	95 1/2 97 1/2
350 Kossuth.....	95
150 Knicker.....	31 1/2 33 1/2
300 K K Con.....	1
200 Leviathan.....	27 1/2
500 Man-field.....	5 1/2 6
150 Mormon.....	87 1/2
150 Mormon.....	87 1/2
25 Savage.....	15
100 S Barcelona.....	18
150 S Knicker.....	40 1/2 42 1/2
115 South Union.....	1
150 Silver West.....	34 1/2

[WHOLESALE.]	Flow Steel.....	- 9 @ - 10
	Tin Plates.-	
	10x13 1/2 Charcoal.....	10 00 @ 10 50

50 Red Cross.....	2½	55 Union.....	1½
60 Relation.....	1c	70 Wells Fargo ...	12½@10c

Simon Ulmo Females, 12 to 13, Kil.....	33 00@	82 00
Simon Ulmo Females, 14 to 15, Kil.....	66 00@	70 00
Simon Ulmo Females, 16 to 17, Kil.....	72 00@	74 00

Pacific Board—Latest Sales

Butter, Oal.ch'ice 30 @ 37 Bowan Bro.large
 @ 38 can per doz....5 00 @--

Shingles, 3 M .. 3 M Rhinola 3 M 2 50

Facing Board—Latest Sales.

Eastern.....	20 @ 25	Tartar B.....	- @ 75	[Corrected Weekly by SUTRO & Co.]
Flour.ex.fam.hlb	25 @ 60	Oen'd Oysters,dz	2 00 @ 3 50	SAN FRANCISCO, June 14. 3 P.M.

[illegible]

Mining Share Market.

The whole market during the past week has been rather on the decline. Even the omnipotent Con. Virginia has moved on the downward path. Everybody on California street makes a long face and only a few fortunate shorts are looking healthy. Hale & Norcross, which made such a good start, dropped again and all we can learn by the single one is a long question: What is the matter with Consolidated? Has the bottom been reached? Or what? But there is no answer to that question from the managers of the mine, and as it is with mining stocks, as with a new fashion—when the leaders drop it, the followers do the same, we will most likely see some very rough business going in the boards for the next week to come.

One of the best known members of the old board, Mr. Jas. H. Latham, died last week on the voyage to Europe. In respect to his memory the board was closed on Monday afternoon.

Rock Drilling.

The following table is from Mr. E. C. Burr, Superintendent of the Mariposa land and mining company, and has evidently been carefully prepared. We are ready to print reliable statistical matter which is of general interest.

Machine Drilling in River Tunnel, Mariposa Estate, From April 24th to May 20th, 1876.												
For week ending	Number and Depth of Holes, in Feet.											
	2 1/2 ft.	3 1/2 ft.	4 1/2 ft.	5 3/4 ft.	6 1/2 ft.	7 7/8 ft.	8	Total holes.	Total feet drilled.	Holes fired.	Reloaded.	Hours run.
April 29th.	6	9	10	51	86			166	776 1/2	169	70	117
May 7th.	6	8	9	50	130	3	2	209	905 1/2	244	34	111 1/2
May 13th.	6	1	9	50	150	58	2	244	1195 1/2	244	44	111 1/2
May 20th.	4	2	7	41	78	125	2	250	635 1/2	253	1	101 1/2
Total.	14	16	17	200	395	100	4	876	4242	898	108	448 1/2
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the 1700-ft level getting along well. The north drift at the 1400-ft level is advancing at a very good rate in favorable material.

NORTH CARBON.—The new compartment to the shaft being completed gives a first-rate, well timbered, three-compartment working shaft from the surface down to the tunnel level. The new hoisting works will be able to start up in a day or two.

TAHOE.—The combination shaft being sunk on the line between this and the Lady Bryan claims by both companies, is being sunk at a lively rate. It is very favorably located and when deep enough will be made connect by drift with the 330-ft level of the Lady Bryan mine.

HALE & NORCROSS.—The new pumping machinery arrangements are being pushed forward to completion with the characteristic energy of the management. The new boilers are in place, the building over them completed and in the main incline the tanks and bob pits for the pumps are being cut out.

ELCZER.—Daily yield, 400 tons, the old ore producing levels holding out pretty well yet, although the ore is not of very high grade. It pays expenses pretty well, however.

UTAH.—The lift-pump just put in at the 650-ft level is working splendidly, and a drift is now being run around the shaft to the tank, in order to run all the water flowing from the level and above to the tank, to ascertain if it is not practicable to sink the shaft deeper hereafter without any pump below this level.

UNION CONSOLIDATED.—The face of the north drift at the 1300-ft level continues in very favorable ledge material, consisting of porphyry, clay and low grade quartz. **BALTIMORE AND AME LOAN FLAT.**—The face of the main drift at the 1250-ft level is in porphyry, clay and quartz, and the drift at the 1030-ft level is in the same encouraging material.

DARTON.—Sinking of the main shaft deeper proceeds at a satisfactory rate. The drifts north and south at the 500-ft level are getting along finely.

FLORIDA.—Main drift at the 400-ft level continues impeded by an overplus of water, but the work of clearing out and re timbering is being pushed ahead to completion.

SILVER HILL.—The strong flow of water in the incline still continues. Rock at the bottom rather hard and sinking progresses necessarily slow.

LADY WASHINGTON.—Bottom of the shaft still continues in the same very favorable Comstock vein matter and the shaft is making the usual excellent progress.

SILVER NEVADA.—Good work is being done in the various drifts at the 1000, 1250 and 1500-ft levels, with no new ore developments to note since last report.

WELLS-FARGO.—Work driving ahead vigorously with three shifts of men. Face of drift in very promising looking vein matter.

TWIN PEAKS.—The fine white Comstock ore development in the shaft of this mine continues its excellent showing.

LADY BRYAN.—Very good progress is being made with the excavations and stone work for the new machinery.

CONSOLIDATED VIRGINIA.—Daily yield, 550 tons, from the regular producing levels. The drift east from the 1600-ft level to connect with the C. & O. shaft is advancing well, and the drift west from the shaft to meet it is progressing at a still more rapid rate, owing to better air and working facilities. The great heat in the drift north at the 1700-ft level impedes the progress considerably at that point. Work on the new steam mill and the new pen or amalgamating mill is driving ahead energetically, and the foundation for the condenser of the pumping engines is nearly completed. The usual monthly dividend of \$2 per share was declared day before yesterday.

CALIFORNIA.—Daily yield, 350 tons of ore. The extraction of the ore is going on very actively, but just commenced, and each month's yield of bullion continues to surpass the other in regular progression highly gratifying to stockholders. The usual monthly dividend of \$2 per share is declared to day, aggregating \$1,030,000. The lateral drift at the 1400-ft level reached its connection with the Ophir mine last Monday, giving valuable air circulation. The strong flow of water in the C. & O. shaft is now impeding progress, about 15 or 16 feet per week being the regular progress. The drift to connect with this shaft at the 1500-ft level is progressing at a very lively rate from both ends.

IMPERIAL.—North winze below the 2000-ft level, near the Alpha, down 62 feet, with very excellent ore the full size of the winze, which assays from \$100 to \$1,000 per ton. The south winze, near the Coudeance north level, is down 23 feet and will shortly connect with the north drift on the 1940-ft level of the Yellow Jacket mine. The bottom is in easy working ledge material.

JUSTICE.—The ore stops at the 600-ft level, as well as the upraise from that level, are looking and yielding well, and showing improvement as further opened and developed. At the 800-ft level the face of the south drift is also showing well, and is evidently fast nearing its intersection with the ore body from the 600-ft level. The flow of water continues strong, with no abatement, but is handled with ease, the pumping and other machinery operating splendidly.

CROWN POINT.—Excellent progress continues to be made with the south drift at the 1700-ft level, and the east cross-cut at the 1600-ft level, with no new features to report at any point.

MAZON.—Sinking the shaft for another level is actively resumed and making excellent headway. The new pump is working well, handling the water to very good advantage.

ORILLAB-POTOSI.—Daily yield, 115 tons, giving an average assay of \$31 from car samples. The bullion production for May footed up to \$29,224.40. The drift east at the 1350-ft level having connected with the Julia shaft, air is being conveyed advantageously, circulation of air is secured. Sinking the main incline proceeds at the usual satisfactory rate, and the new combination shaft is making excellent progress.

JULIA.—At the 1500-ft level the main southwest drift is advancing slowly, owing to the intense heat, and is in a very favorable formation of clay and quartz. The rest of the main west drift at the 1600-ft level is now in soft, wet porphyry, with small streaks of quartz and clay.

OVERMAN.—The daily yield is now about 25 tons, coming from the 900-ft level. The ore breasts at that point hold out well, and give good promise for the future. A plunger pump is being put in at the 1200-ft station. The pit for a tank at that point is completed, and sinking the shaft deeper will be resumed in a day or two.

CALIFORNIA.—A heavy flow of water was tapped last week in the shaft, which increased so fast that the pump was overpowered, and sinking had to be suspended. It rose to the height of 60 feet, but the pump has got the best of the situation.

ORILLAB.—Daily yield, 185 tons. The ore sections are showing improvement at the 1500 and 1600 ft levels, and the north drift at the 1600-ft level is making very good advancement toward the Mexican line. The cross-cut from the north drift at the 1100-ft level is fast nearing its connection with the upraise from the 1300-ft level. Sinking and raising for the main incline connection between the 1600 and 1700-ft level progresses at a very favorable rate, and the work in the mine generally is getting along finely.

SUTRO TUNNEL.—Total length of tunnel to day, 13,348 feet. Water still on the increase, but any sudden and disastrous flow is carefully guarded against by keeping ahead some distance. Good little streaks of low grade ore are quite frequently cut through by the face of the header.

COMMONWEALTH.—The upraise from the main tunnel or adit level has at last been brought to a surface. A splendid and much needed supply of pure air thus secured. The good ore resources developed by this winze will be made available at the earliest opportunity.

MOORE.—The water encountered proving to be a little too much to manage with present facilities, sinking had to be suspended until the proper pumping and hoisting machinery can be procured and erected. This

is contracted for and will be brought to bear in the case as soon as possible.

MEXICAN.—The face of the north drift at the 1465-ft level is in very favorable looking ledge matter, being in the wall of the ore vein. Cross-cutting will be done when the proper point is arrived at. Sinking the winze below this level at the west side is commenced.

ALTA.—The new surface machinery is being placed in position as fast as possible, and the work is being done in a very substantial, workmanlike manner. When completed, the Alta hoisting works will compare favorably with the best in the Comstock lode.

GOLD & CURRY.—Good progress continues to be made re timbering the double winze or incline, and the bob and tank pits for the new pumping machinery are being got ready as fast as possible. Hot air impedes progress at the lowest levels considerably.

SAVAOE.—Lively work is being done getting the surface machinery arrangements well under way. The hoisting and tanks in the shaft are already completed, and the pump will be started to running at the earliest practicable time.

BUCKEYE.—Both drifts north and south are pushing ahead. South drift in good ore indications, and a raise will soon be commenced from it to connect with the winze being sunk from the level above. Water decreasing.

COMMONWEALTH.—Excellent work being done sinking the shaft, the rock working favorably and showing very good ore indications. The face of the tunnel is in highly encouraging material, showing and promising well.

EUROPA.—Sinking the shaft goes steadily ahead as usual. The material at the bottom works easily and favorably. Some little increase of water has been encountered, but it has subsided again to the regular quantity.

DERBY.—Rock at the bottom of the shaft working favorably, allowing of good progress. The frame for the hoisting works building is being got ready. The building will be substantial and of good size for the purpose.

PERSPECT.—Nineteen more feet in depth has been added to the shaft since last week's report, making it 302 feet deep in all. The steam pump keeps the water out.

NORTH CON. VIRGINIA.—Some increase of water, with rock about the same as last week—rather hard. Are hurrying up work on the foundations for the new pumping machinery, and making good progress.

WEST BELCHER.—Work progressing well in both west and northwest drifts. Are now busy putting up an ore dump. Shall commence the extraction and milling of ore as soon as the dump is completed.

WARD.—New machinery nearly ready to start up. Meanwhile the grading and stone work for the surface buildings is being pushed forward actively and the sinking of the shaft progresses as usual.

ORIGINAL GOLD HILL.—Sinking deeper for another level is resumed. Shall drift for the south ore body at 100 feet deeper than present bottom of shaft, which will open up a large amount of good pay ore.

ALABAMA.—Sinking the new three-compartment shaft was suspended for a few days in order to make a road and bring in the requisite timbers. This is completed and sinking goes on as before.

PROTON.—The winze station in the main north drift is completed, and sinking the winze is actively commenced under the most favorable auspices. Rock works easy and no water to trouble.

VIVIAN.—The usual quantity of good milling ore continues from the old stopes, and some very fair ore is being produced from the 120-ft level. No more trouble from water in the incline.

BALTIMORE CONSOLIDATED.—Excellent stringers of favorable looking quartz are being cut through this week by the drift, and better headway is being made than heretofore, the rock being softer.

NEVADA.—Drift pushing steadily ahead in quartz and porphyry. Expect to reach main ore chimney before long, judging from present indications.

GLASGOW.—The heavy flow of water encountered is being drained by the sinking of the combination shaft to the level of Glasgow.

COLUMBIA.—As soon as the enlargement of the shaft is completed, which will be very shortly, sinking deeper will be resumed.

ROUGH & READY.—The financial and legal troubles are being settled, and sinking will be resumed as soon as deemed expedient.

ROCK ISLAND.—South drift at 650-ft level has a fine showing of very favorable quartz in its face, some streaks of which assay well. The west drift at the 850-ft level also shows considerable improvement, and the north drift at this level is making good progress in fine looking quartz.

BEST & BELCHER.—Repairs to the double incline winze being forward at as lively a rate as practicable, and when the Gould & Curry pumping arrangements are completed and at work, the development of this mine will be proceeded with.

KOSUTHA.—Work going ahead lively at all points, the water being drained but no new features of interest to report this time.

ANTICREBOCKE.—Bottom of shaft in easy working ledge material, with little water to interfere with good progress being made in sinking.

SOUTHERN CON. VIRGINIA.—The ledge is showing finely, giving excellent assays and widens as it is followed north, with well defined walls.

MINT.—Shaft down 1,113 feet and bottom now in hard country rock. No increase of water. Machinery working well.

LEVATHAN.—Rock in face of drift somewhat softer and more favorable than last week. Drift in 133 feet. SEMANOR CON. VIRGINIA.—Sinking at present in very encouraging vein material and getting along finely.

MORNING STAR.—Making the usual good progress in sinking the shaft. Nothing new to report.

NIAGARA.—Main incline shaft down 329 feet, with bottom in soft and favorable vein matter.

DANEY.—Sinking the shaft is resumed, the pump having got the best of the water.

DEVON.—Sinking the shaft is resumed, the new steam hoisting works operating well.

EAST OVERMAN.—The quartz in the bottom of the shaft shows well and gives good assays.

PHIL SHERIDAN.—Shaft down 178 feet with the bottom in favorable working material.

MONUMENTAL.—Shaft 183 feet deep, with bottom in hard rock but blasting well.

NEW YORK CONSOLIDATED.—Nothing new to report. Work going ahead as usual.

ANOTHER GAS MACHINE.—An apparatus for the manufacture and utilization of combustible gases has been patented in England. In this invention bituminous coal is placed in retort and subjected to distillation. The rich hydrocarbons are eliminated therefrom in the form of gas, but when the stage of distillation is reached at which the sulphurous and phosphoretted gases are disengaged from the coal the gaseous products of the retort are diverted from the previous and purer product, and are passed into water or carried to the furnace, in order to aid by their combustion the heating of the retort. The result is a comparatively pure hydrocarbon gas and a coke practically free from sulphur, phosphorus, etc. From the purifiers the gas passes to the gasometer. From the gasometer the gas is passed to a retort filled with broken fire brick; as the hydrogen is separated from the carbon it assumes the volume peculiar to the gas.

Pig Iron Trade of San Francisco.

The quantity of Iron used on this coast annually, whether in the shape of Pig Iron, Bar and Bundle, or manufactured into Hardware, etc., cannot be less than 60,000 tons, worth manufactured at least \$3,000,000. In a manufactured state it is worth at least \$10,000,000 a year. It is, therefore, one of the most important articles of merchandise that is dealt with in this port. And when we say that during the past ten years our people have paid out seventy millions of dollars, the greater part of which has gone into the pockets of foreign and Eastern merchants and manufacturers, it will be allowed that the development of the iron resources of this coast is at least worth an effort. In this regard a statement of the imports and consumption of Pig Iron for the past few years is not without interest, and we here present one to our readers.

The consumption of Pig Iron on this coast has increased in an irregular way for the past seven or eight years, and was last year double what it was in 1870. The greatest previous consumption was in 1874, and the next in 1871, when 12,509 tons were worked up by our foundries. The following table gives imports, consumption and stock at the close of every year since 1869, inclusive of that year:

	Imports.	Consumption.	Stock over.
1869.....	Tons 13,820	8,674	12,663
1870.....	9,323	9,282	12,647
1871.....	5,499	12,509	5,537
1872.....	13,168	10,234	8,571
1873.....	8,337	9,122	7,786
1874.....	8,414	14,816	1,394
1875.....	25,584	17,718	12,260

It will from this be seen that the importations of 1869, which were a third greater than those of 1868, were not kept up for the two following years, but that they fell off, until in 1871 they were less than one-half what they had been two years before. All this while, however, the consumption continued to increase, till in 1871 it was 12,509 tons—fifty per cent. greater than in 1870. In 1872 the importations rose again to the figures of 1870, while the consumption diminished, as it did also in the following year. These were two medium years for the iron foundries, and the importations again fell off, to increase a little in 1874, and last year to reach 25,584 tons, the greatest ever known in the State, and more than double that of any previous year since 1868. This was caused by the activity of the foundries last year and the increase in consumption, which was far and ahead that of any previous year in the history of the State.

Prices have varied much during the past seven years. In 1869 they ranged from \$30 to \$45 per ton—nearly the same range as last year, which was also like 1870, a year of large importations. The following year the price was low, declining towards the close to \$29.50 and \$30.00—subsequently recovering to \$34.50 and \$35.00, at which it closed. During 1871 it ranged from \$32.50 to \$34.00 for the greater part of the year, advancing to \$50 and \$55 towards the close, as stocks had run very low. The next year was a high one in the Pig Iron market, the price running up to \$75 and \$80 in the Summer, but declining towards December to the opening prices of January. In 1873 high prices also prevailed, but towards the close there was a decline, which reached its lowest point in June, 1874. From this to the close there was an advance, but the past year has witnessed a very decided decline, and now prices are on the basis of what they were seven years ago. The market for White Pig Iron has followed nearly the same course. The following tables give the prices monthly for the past six years:

Scotch Soft.			—1871—			—1872—		
January.....	\$33 @ \$34	\$34 @	—	\$52 @	—	—	—	—
February.....	33 @ 34	34 @	—	45 @	\$57	—	—	—
March.....	32 @ 34	33 @ \$34	—	56 @	60	—	—	—
April.....	31 @ 32	32 @ 34	—	70 @	75	—	—	—
May.....	30 @ 31	32 @	—	70 @	80	—	—	—
June.....	29 @ 30	32 @ 33	—	75 @	80	—	—	—
July.....	29 @ 30	33 @	—	70 @	—	—	—	—
August.....	29 @ 30	33 @ 34	—	54 @	57 1/2	—	—	—
September.....	29 @ 30	34 @	—	55 @	57 1/2	—	—	—
October.....	29 1/2 @ 30 1/2	34 @ 40	—	50 @	55	—	—	—
November.....	30 @ 33	39 1/2 @ 52 1/2	—	52 @	55	—	—	—
December.....	34 1/2 @ 35	52 1/2 @ 55	—	50 @	52	—	—	—

English and American White.			—1871—			—1872—		
January.....	\$30 @	\$32 @ \$32 1/2	—	\$50 @	—	—	—	—
February.....	30 @ 32	32 @ 32 1/2	—	55 @	—	—	—	—
March.....	28 @ 30	33 @ 36	—	55 @	—	—	—	—
April.....	28 @ 29	37 @ 38	—	60 @	—	—	—	—
May.....	28 @ 29	40 @	—	65 @	—	—	—	—
June.....	28 @	40 @	—	65 @	—	—	—	—
July.....	28 @	40 @	—	52 1/2 @	55	—	—	—
August.....	26 @ 27	35 @ 37 1/2	—	55 @	—	—	—	—
September.....	26 @ 27	34 @ 35	—	52 1/2 @	—	—	—	—
October.....	27 @ 28	40 @	—	52 1/2 @	—	—	—	—
November.....	30 @ 32	42 1/2 @ 45	—	52 1/2 @	—	—	—	—
December.....	32 @ 33	45 @	—	52 1/2 @	—	—	—	—

Since the beginning of the present year importations have been heavy, consumption light, and prices low, but a good demand is anticipated. Imports for the first four months of the past two years compare as follows:

As the resumption of work by the foundries has been slow this year, and as there are large quantities on the way, no very great advance on present rates may be expected during the balance of the season.

The consumption of 1876 will doubtless be equal to that of the last, as there may be anticipated a vigorous resumption of work and its con-

tinuance throughout the Fall till towards the close of the year. Of this Oregon will probably supply 1200 tons, and this is all that may be expected from Pacific Coast sources for some time. The Iron of our sister State is of the very best quality, and has always commanded a ready sale in our markets, and the enterprise which has mined it and shipped it to this city might in this State be very well imitated. We possess illimitable Iron resources, and it argues a great lack of industrial vigor that we have allowed them to go undeveloped so long. It also argues a lack of good sense, for the manufacture would undoubtedly pay, while our people neglect it, at the same time that they run wildly after every wildcat gold and silver mine from this to the Missouri.

We have all the Iron ore that we will ever want, timber fitted for making Charcoal adjacent to the ore beds, a consumption yearly in Castings, Railroad Iron, Manufactured Iron and Hardware of 60,000 tons—one, too, constantly increasing—we need associated capital, enterprise and skill. When we have utilized these in the development of our Iron resources, we shall have added largely and enduringly to our riches. A Birmingham or a Sheffield on this coast would find customers from Behring's Straits to Terra del Fuego, and from Panama to the Cape of Storms. —S. F. Journal of Commerce.

Odd Moments in the Shop.

There is probably no more important question one can ask the young man in the shop, than "What do you do with your odd moments?" Upon the way in which his spare time is employed depends, in great degree, a man's success in life. We have been in shops in the country where an idle afternoon was spent in playing checkers or "loading," and where the only reading done was of newspaper stories of the cheapest kind. Young men who fall into the habit of wasting the time in the shop during which they cannot be at work, are neglecting their opportunities. Sometimes athletic sports take up all the moments that can be spared from labor. It is rare, however, to see a young man busy at such times with anything which can in any way be useful to him. We know of one young man, at every opportunity, studied the engine of the establishment, and used it the first chapter of a course in mechanical engineering. Three books on the subject were bought and kept at hand, so that at any time they could be taken up. In a short time he was promoted into the engineer's department—as wiper, if we remember rightly. This gave him more time in working hours, which was devoted to the study of the engine, the theory of steam, valve gears, etc. As wages were increased more books were bought, and in this way the young man obtained a superior knowledge of the trade, which in the end was a source of great revenue to him. In the shop is emphatically the place to study the trade at which one is at work. Leisure moments, if improved, will often enable one to obtain a vast amount of practical knowledge. Out of the shop there are thousand things to distract the attention, the tools are not at hand, and a good share of courage is needed to hold the attention down to work. In the shop it is not nearly so hard. Conveniences are at hand, and everything is favorable to the acquisition of knowledge. It will be found a general rule that men are quite willing to instruct those who seek after knowledge, and in the shop the older and more experienced are often very glad to take pains with the younger ones, if they only show an interest in improving. Unfortunately, there are too few young men who care much for extra instruction. They only wish for so much knowledge as will carry them through the ordinary journey work, and do not aspire to become superior workmen.—Iron Age.

PRODUCTION OF SILVER IN THE WHOLE WORLD.—According to recent statistics the production of silver in the whole world in 1800 was \$35,000,000, which rose in 1850 to \$42,500,000, in 1854 to \$47,500,000, and in 1865 to about \$62,500,000. The production of this precious metal during the year 1873 is subdivided as follows: England and its colonies, \$10,000,000; Norway, Sweden and Denmark, \$250,000; Russia, \$500,000; Austria, \$1,620,000; Germany, \$3,000,000; France, \$2,000,000; Spain, \$2,000,000; Sardinia, \$500,000; Mexico, \$20,000,000; Central and South America, \$8,000,000; Canada, \$900,000; the United States, \$36,500,000, which gives a total of \$85,250,000. Including the year 1873, it is estimated that the total production of silver, since the discovery of the new world by Christopher Columbus, has been \$715,000,000, the largest source of accession, during late years, being due to the Nevada mines.—Scientific American.

IRON SHEETS THINNER THAN PAPER.—We have heard of iron as thin as paper, but have just had a packet of specimen iron sheets brought to our office, not half as thick as the sheet this is printed on. This sheet is 0.004-inch in thickness; the iron sheets we have received are 0.0015-inch thick, or only three-eighths the thickness of the paper. At the same time the iron sheets are so tough as to be torn with difficulty, and so flexible as to bend with almost the facility of ordinary printing paper. These wonderful specimens of iron were made from the rough pig up to the rolled sheets by our neighbors, the Pearson and Knowles iron company, whose skillful manager, Mr. Hooper, has discovered a means of rolling these infinitesimally thin sheets in numbers without their sticking together.—Warrington (England) Guardian.

USEFUL INFORMATION.

Hanging Shafting.

Mr. R. James Abernathy, of Moline, Ill., gives the following practical hints on putting up shafting: A line of shafting should be perfectly straight, with no twist whatever in the bearings, and more particularly so if it be a rapidly moving shaft. A very quick moving shaft with the least possible twist causes unnecessary friction, and makes a wonderful difference in the power required to drive it; and in slow moving shafts this difference is proportionately great.

The first or main line of shafting ought to be squared with the building, and all other lines, whether parallel to or at right angles, should be taken from that. Parallel lines can generally be carried over by correct measurement from extreme points, and this is really the most correct way of getting counter lines.

For a line running at right angles, first establish a center point on the line already down, then two other points at convenient and equal distances on each side of the center point; then procure a long sweep, and, from the points made, describe two short arcs, and where these two arcs cross or cut each other, make a point, and from the center point already made on the main line draw a line through the point last made. If done very correctly, it will form an exact right angle or square line. This, in geometry, is called erecting or raising a perpendicular, and it is among the first lessons taught in that branch of mathematics. To the practical mechanic it frequently becomes useful in many ways. Lines of shafting running at right angles are always connected by bevel or miter wheels, and in gearing these together it is important to have the centers very exact, as the least variation will make the teeth bind, causing them not only to run hard but to make much noise.

Pitch lines should run together, or as nearly so as possible. In this respect, however, millwrights are frequently troubled on account of wheels not matching properly. This is the fault of the pattern maker. In such cases the millwright must exercise his judgment in setting them together so as to run freely and easily.

In addition to being perfectly straight, all lying or hanging shafting must be perfectly level, and all upright shafts must be exactly plumb or perpendicular. By following these few simple directions there need never be any bad working shafting.—*Iron Age*.

How to Paper a Wall.

The paper, first of all, is to be trimmed on one edge; then get the height of your ceiling, cutting the bolts into pieces of proper length, and matching the figure carefully.

For a paste clear corn starch is the best, made precisely as you make for starching clothes. It is well to use a small quantity of carbolic acid in it, as a protection against vermin. A thin paste of wheat, or better, rye flour, is, however, very good for anything except the most delicate papers. The wall should be smooth, and if very smoky, or greasy in spots, it should be washed with weak lye or soap suds.

Lay your trimmed and cut paper, face down, on a long table or smooth board; with a brush—an old whitewash brush is good—spread the paste evenly over the upper piece; do not put more than just a coating on; then take hold of the lower end of the piece and fold it loosely over, part way up, then lift the piece up and fix it carefully in place, smoothing it down with a towel or cloth. Never mind a few wrinkles, they will all disappear as the paper dries. Put the next piece on the same way, matching nicely, and overlapping the trimmed edge on to the untrimmed edge of the first. It is much easier to have an assistant to care for the lower part of the pieces as you put them on. Skip spaces over windows and doors, and fill them up when the rest is done; then put up the border, cutting in convenient lengths for handling.

A word on the style of papers. Avoid glaring contrasts in colors, and large staring patterns, as out of taste and tiresome to the eye. Choose rather neutral tints, and colors that harmonize and blend agreeably together and with the general tone of your carpets and furniture. Even with a bare floor and plain wooden chairs, the effect of a soft tinted paper gives a vastly different impression than if the wall is disfigured with glaring figures and contrasting colors. If your ceilings are low, lighten the appearance by a figure which runs perpendicularly through the paper.—*Western Farm Journal*.

Classification of Nails.

The origin of the terms "six-penny," "ten-penny," etc., as applied to nails, though not commonly known, is involved in no mystery whatever. Nails have been made a certain number of pounds to the 1,000 for many years, and are still reckoned in that way in England, a 10d being 1,000 nails to ten pounds, and 6d, being 1,000 to six pounds, a 20 weighing 20 pounds to the 1,000 and having just one-half the number of nails to the 10 pounds of the 10d, and in ordering the buyer calls for the three-pound, six-pound or ten-pound variety, etc., until by the Englishmen's abbreviation of pnn for pound the abbreviation has been made to stand for penny instead of pound, as

originally intended; and when it comes to less than one pound to the 1,000, such as tacks, brads, etc., they are reckoned six-ounce, eight-ounce, 12-ounce, etc., and the manufacturer who would make less than 1,000 nails to 10 pounds for a 10d. nail, would be looked upon as a cheat, as in former times the difference in the cost of the manufacture of one pound of the small nails over the larger sizes was much greater than now. As nails are now made and sold, the dealer only asks for the size needed, by the usual designation, and the fact that there are now but about two-thirds of the number of nails formerly called for in the pound does not lessen the value.

STAINING GROWING WOOD.—Professor Stebbins, in a letter to one of the photographic journals, declares that, ere long, we shall be able to have all our furniture—even articles of common deal—of such a beautiful color as to throw out of fashion mahogany and other foreign woods. A Freuchman has discovered a new method of compelling the tree to color itself. He operates upon it at the moment when the sap is rising after its winter's repose to give life and vitality to the branches. He introduces a chemical (how?) into this vivifying agent, and it distributes the coloring composition through every pore and fiber of the tree! When the coloration is terminated the knots and veins contain such a multitude of shades, harmonizing one with the other, that furniture made of it has at once a strange and fascinating appearance.

WOOD FOR CABINET MAKERS.—A Mr. Gerding, who has been prospecting in Mexico for cabinet woods, has discovered three varieties of the walnut—white, red, and black—in great abundance. Of these the black is the most valuable, as it is curly in grain, and as fine as the European or South Sea island wood. The discovery is very important, as walnut is in such universal demand for manufacturing purposes, and has never before been found on the Pacific coast, but has had to be brought from the East.

MASTIC FOR FASTENING INDIA RUBBER ON METALS.—A mastic for fastening india rubber on metals may be obtained by steeping gum lac, in the form of pulverized scales, in ten times its weight of concentrated ammonia. A transparent mass is thus formed, which, at the end of three or four weeks, becomes fluid without the use of warm water. This substance, applied on india rubber, becomes hard, and completely impervious to liquids and gases.—*Moniteur Industriel Belge*.

GOOD HEALTH.

Miasms.

Typhoid fevers are the result of the blood becoming poisoned by miasms, and are much more difficult to cure than to prevent. Farmers may think themselves less exposed to the corrupting influences of miasm than are the dwellers of the city or village, and it is true that the air of the country is more pure than the air of the city, but it is also true that miasms are often found lurking around the farm-house. Nor are they confined to river bottoms and low lands; we have known them to be prevalent in mountain towns. High places are not necessarily destitute of swamps and deceiving animal and vegetable matters, and wherever these are found the seeds of disease are surely generated.

Miasm is such a subtle poison, propagates itself, like yeast, so abundantly, that we desire to call the attention of farmers to the propagating beds to which the farm-houses are particularly exposed, and the first we mention is the cellar. There are wont to be stored lots of vegetables for the wants of the family and the stock. It is the wrong place. The barn should have a cellar just as necessarily as the house. Piles of vegetables will heat and corrupt more or less during the winter, and as soon as spring opens they of course begin to decompose, in order to recombine new vegetation. The windows of the cellar should be taken out, the gangway thrown open, and a good circulation of air kept up in the cellar from this time till late in autumn. Old boards and all decaying timber, as well as old lime and other refuse, should be removed, the whitewash brush applied to the walls, and slaked lime or other disinfectants scattered on the floor.

It will greatly aid in promoting a pure air in the cellar and health in the household if an opening be made from the cellar into the chimney, so that all impurities may find vent up this most convenient channel for ventilation.

Another great generator of miasm in the farm-house, and indeed in all houses, is the sink, which is too often the sink of iniquity and death. If there is anything that will generate vile odors and seeds of disease it is the fermenting compound of soap-suds, dirt, and effete exhalations from the human body to be found in the wash-tub of the laundry.

What to do with the waste water of the sink and wash-tub is one of the problems of country life which is not fully solved. It is too valuable to be lost, and too unhealthy to be kept near the house. To throw it, as many do, from the kitchen door, and leave it there to contaminate the air, is tempting the grim messenger of death to shoot his fatal arrows. If death should ensue, there should nothing be said about the mysterious Providence. The only mystery is that more sickness and death

do not result from the malarious atmosphere of the surface cesspool.

Probably the best mode of ridding the premises of miasm from sinks is to conduct the waste water in iron or cement pipes to a cesspool some distance from the house, and keep this pool well filled with some absorbent, such as dry muck, fine charcoal, or loam. The sink itself should be of iron, and furnished with a valve outlet, so that the gases from the pipes cannot return into the house. A wooden sink is apt to become saturated with the odors generated in the pores of the wood. If wood must be used for sinks, use a solution of copperas frequently to keep them wholesome.

All stagnant water, all marshy places, are fruitful sources of miasm. Let the marshes be drained and the hollow places be filled up. Set out a row of white pines between the house and barn to ward off or absorb the effluvia; keep the homestead every way neat and the air pure, and the health and comfort of the household will amply compensate for the labor.—*N. Y. Times*.

Sunlight.

There is no time in the year when sunlight is so vivifying as in the spring. Perhaps the skillful scientist who can weigh it and tell with how many million tons it presses upon the earth might explain why the ray is more potent as the days lengthen; but that would not change the fact. Instead of excluding it from our houses lest it fade damask and brussels, draw flies and bring freckles, we should open every door and window and bid it enter. It brings life and health and joy. There is healing in its beams. It drives away disease, dampness, mold, megrims. Instead of doing this, however, our careful housekeepers will close the blinds, draw down the shades, lock the doors, shut out the glorifying ray, and rejoice in the dim and musty coolness and twilight of their unhealthy apartments. It is pleasant and not unwholesome during the glare of the noontide to subdue the light and exclude the air quivering with tides of heat, but in the morning and in the evening we may freely indulge the sun bath, and let it flood all our rooms, and if at its very fiercest and brightest it has full entrance to our sleeping rooms, so much the better for us. Wire netting in doors and windows excludes not flies and mosquitoes only, but all other insects, and those who have once used it will continue to do so. With this as a protection from intrusive winged creatures one may quite dispense with shades and shutters, and enjoy all the benefits of an open house without any annoyances so frequent in warm weather. But better the annoyances with sunshine than freedom from them without it.—*Tribune*.

Cures for Felons.

Take common rock salt, dry it in an oven, then pound it fine and mix with an equal quantity of spirits of turpentine. Put it on a cloth and wrap it around the part affected, and as it gets dry put on more. Cures in 24 hours.

Apply a rag wet with tincture of lobelia and keep it constantly wet. Said to be a certain cure.

Poke root (*Phytolacca decandra*) roasted in hot ashes until soft, and then mashed and applied as a poultice, is unrivaled in felons and humors of various kinds. It dissolves them rapidly, or if too far advanced, hastens their suppuration.

A piece of adhesive plaster an inch in width and long enough to go once and a half around the finger, should have spread upon it a surface of caustherial plaster the size of a three-cent piece. This surface should be applied over the tender part and lapped. Allow it to remain for 24 hours at least, and then, if blistering has occurred, the skin may be raised, and beneath it will be found a small opening not exceeding a line in diameter, which penetrates the deep tissue and discharges pus. If the blister is applied during the first three days, this is all-sufficient for a cure; and if the disease has run longer than this, its course is shortened and the cure remarkably quick. The plaster should remain forty-eight hours when applied to the hands of laboring men, a fresh one being furnished at the end of 24 hours. In these cases the opening may be enlarged, as the quantity of pus is greater. The pain is greatly diminished during the action of the blister.—*St. Louis Eclectic Medical Journal*, March, 1876.

THE WATER GAS HUMBO AGAIN.—The Chicago *Times* is the latest victim of the absurd water gas delusion. A "Professor" Kendall, that too cooing journal asserts, has exhibited to its representative "an apparatus which burns from one-fourth to seven-eighths as much water as it does any other combustible fluid," makes gas better than that produced from coke (!) at 50 cents per 1,000 feet, and produces sufficient fire "to do the cooking and washing for six persons for seven days for a like small sum." The *Times* says that "the result overwhelms the mind with its wonderful possibilities," and that "it will astonish the scientist as well as the uneducated and the undisciplined." We fear that all the astonishment regarding the subject will be at the ignorance and credulity of the Chicago paper. Water is nothing but the result of burnt hydrogen, which gave out its heat at the time of its combustion. No fuel can be burnt twice, and it is as impossible to burn hydrogen in water or watery vapor as it is to burn carbon in atmospheric carbonic acid.

The Black Hills Country.

The following article presents a rather discouraging view of the mining and other interests in the Black hills country:

A reaction of feeling against the Black hills mining has set in, and it appears to be supported by facts, though there is no doubt that some of the stories told by returning adventurers were invented purely for a story's sake. A specimen case of the kind is that of a party lately returned to Denver from the mining country with their wagon riddled with bullets, holes, and with one of their number so wounded that his arm was carried in a sling. This they said was the work of Indians, but it afterwards came out that they did not meet with a single Indian; that they shot their own bullets through the wagon, for the sake of making a sensation, and that the wounded man was accidentally hurt during this operation. Yet there is doubtless great danger to life and property in the Black hills region, and the enthusiasm awakened by General Custer's report of a rich gold country was caused by a very exaggerated idea of the value of the gold diggings.

Reports by way of Cheyenne from returning miners say that the number of murders committed by the Indians has not been fully told. The Indians are said to harass the miners constantly, and among the whites themselves there are so many desperate men that life is quite insecure. The miners number about 2,500, but they are distrustful of each other, unharmonious and broken into small parties, and are easily exposed to the mercies of the Sioux. They are frightened at their danger and propose to organize a volunteer force to fight the Indians by Indian tactics, who are said to be growing worse and worse every day. Gold in paying quantities is found in some places, but the expectations of a few months ago are far from realization, and it is said to be the opinion of California miners that there is little foundation for them. Few miners are finding enough gold to pay their expenses, and many are leaving the diggings. Now that the character of the region is so well known, where is the wisdom of an Indian war to punish these murderous red men? It sounds finely to talk of asserting the dignity of the Government and inflicting righteous retribution upon the raiders, but the true policy of the Government is to take the course which will ultimately tend best to secure the peace of the frontier; and how the proposed expedition of Gen. Crook will do that is clear only to those who believe in the policy of extermination. The exploration of the Black hills region has not been a felicitous event, and any further disturbance of the Indians there, so long in advance of the needs of civilization, with so slight inducements for the miner or farmer, would seem a mistaken course. Let the Indians remain undisturbed as long as their lands are not wanted, and let all dealings with them be by honest men, and both Indians and whites will be gainers.

A Cheyenne special says parties of returning Black hills adventurers are continually arriving there, and state that food, ammunition and gold are extremely scarce. They are continually picked off by hostile Sioux, and the latter are on the plains between the hills and Cheyenne. A party recently found four bodies tomahawked, scalped and riddled with bullets, on their way out. The miners are disheartened, and two-thirds of their number have left. Custer City, which once claimed 1,200 souls, has now only 300. Hill City has 200 empty cabins and 20 miners. Mountain City has six cabins and two inhabitants. The Dead Wood and White Wood gulches, where were 1,000 people, contain now but 200. Little B-e-aver and Potato gulches have about 25 men.

A private dispatch from Custer City states that three men, named Williams, Harrison and Brown, the two former from Cleveland, and the latter from St. Louis, while returning from the Black hills, were tomahawked and scalped by Indians near that city on the night of the 16th, and their entire outfit carried off. The bodies were found about 12 hours after the massacre, and taken to Custer for burial.

The body of J. Leggett, a well-known guide, was brought into Custer City on the 3d instant. He was probably killed by Indians. Over \$4,000 was found on his person.—*Colorado Springs Gazette*.

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DEWEY & CO., Publishers.

A. T. DEWEY,
W. B. EWER,GEO. H. STRONG
JND. L. EDGEEOffice, No. 224 Sansome St., S. E. Corner
of California St., San Francisco.

Subscription and Advertising Rates:

ADVERTISING RATES.—1 week. 1 month. 3 months. 1 year.				
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One-half inch.....	\$1.00	3.00	7.50	24.00
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We wish to thank those subscribers who send in their renewals to the Press promptly as regularly as the year comes round. It saves us much expense in commissions for collections and renewals. May we not request more of our good patrons to do so!

THE ORIGINAL ARTICLES in this paper are mostly set in solid type, giving in our columns one-third more reading than is contained in ordinary leaded matter.

Our latest forms go to press on Thursday evening.

San Francisco:

Saturday Morning, June 17, 1876.

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NEW ADVERTISEMENTS.

Park View Hotel, Philadelphia, Pa.; Union Consolidated Silver Mining Co.—Meeting; Amador Canal and Mining Co.—Sale.

Mining Accidents.

A MAN'S FACE MANGLED.—An accident occurred in the Bowman incline recently where a man was seriously injured and perhaps disfigured for life. The injured man was coming to the surface, riding on the rope in front of the car, when the car ran against the end of a section of the iron with which the wooden track is laid and which had become detached from its fastenings. The car was thrown from the track and the man thrown violently against the end of the protruding iron. The bones of his nose were shattered and crushed and his face and scalp frightfully mangled, though his sustained no injury in a vital part. This riding on the rope is a common though dangerous practice in this mine, this being the second accident which has occurred from the same cause. There is a footway for the men to go up or down, but to save time and sole leather they perch on the rope when the car is going up.—Reese River Revue.

DROWNED IN A SHAFT.—This forenoon, June 12th, a miner named John Martin, working in the Lane & Fuller shaft, Pacific Co., pushed a car into the shaft and was drawn in after it, falling from the 400-foot level to the 550-foot level, a distance of 150 feet, 75 feet of the fall being through space and 75 feet through water. As soon as the accident was made known men were put at work bailing the water and grappling for Martin's body, which was recovered about two o'clock this afternoon. The deceased went to work in the mine for the first time this morning, and Mr. Henan, the Superintendent, attributes the accident to Martin's lack of knowledge of the mine.—Reese River Revue.

Ponderous Mining Works—The Savage Pumping Machinery.

It cannot be doubted that California possesses many advantages in the manufacture of the magnificent machinery. The inventive spirit, inspired by the thoughts of treasures but lightly hidden, serves itself to cope with any requirement, no matter how great or difficult. Possessing the true California quality of enterprise, the manufacturing skill and power follow close upon the thought of the inventor, and the brightest idea is speedily embodied in practical and effective machinery. The result is that the industrial spirit on this coast is more alert, active and progressive than in the older States. Continually gaining strength by past achievement, it pushes forward with new power and vigor. It shrinks from nothing; it achieves everything. We claim that nowhere else in the world is there more spirit, enterprise, inventive and executive ability than among our manufacturers of machinery.

No small part of our success in this direction is due, doubtless, to the fact that our resources are so rich and so accessible. The speed with which immense values are drawn from our mines leads to free investment in means to obtain them. The demand says: "Give us what will do the work, the reward is ours." In answer to such a call our enterprising manufacturers are continually improving their patterns, enlarging their facilities and stimulating their inventive power. This result is growth, progress and improvement, which are an honor to the State, because they establish an independent self reliance in our industries. Everything which the workers of the coast requires the manufacturers of this coast can supply.

We are reminded of the hopeful and promising condition of our manufacturers continually during our inspection of the foundries and workshops, and we have a fresh illustration of it this week in a splendid piece of mechanism which we will describe.

The pumping machinery for the Savage mine, recently completed at the Pacific iron works in this city, is the most complete and extensive ever made on this coast, so in the matter of design and workmanship is alike creditable to the skill of our mechanics and the capacity of our iron works. The engine is what is known as a direct acting compound non-condensing engine, and is from an original design by Mr. William H. Patton, consulting engineer of the Savage mine. It is a very massive affair, being about 40 feet in length and weighing upwards of 100 tons. This engine connects directly with the pump box at the head of the shaft, without the usual intervening crank and gearing. The valves are connected with the Davy differential valve gear, which is operated by an independent engine, by which the strokes of this pump can be varied without any reference to the motion of the main engine.

A somewhat detailed description of this mammoth machinery will doubtless be of interest to the general reader. The engine consists of two horizontal cylinders. The first or initial cylinder is 27 inches in diameter and 8 feet stroke. The second is the expansion cylinder, and is 48 inches diameter and 8 feet stroke. These two cylinders are placed in line and connected by one piston rod, by which the pistons of both cylinders are operated. Attached to this opposite end of the large cylinder is the bed plate with slides and cross-head, to which is attached the connecting rod, which connects directly with the pump box. The steam enters the first cylinder at an average pressure of 90 pounds per square inch, and exhausts into the large cylinder, where it expands down to a pressure of not more than 5 or 6 pounds, thus utilizing the whole expansive power of the steam, and this, we may remark, is the secret of the great economy of the compound engine.

The engine is so arranged as to permit the attachment of a condenser when it shall become necessary to increase its power as the shaft increases in depth. This machinery will now have a lift of about 2,500 feet, but it is capable of raising a column of at least 4,000 feet in depth, with a capacity of 30,000 gallons per hour.

The pumps are stationed every 250 feet in the shaft, each pump being supplied from a tank filled from the pump below. The sinking pump, which is to follow the workings of the shaft, is 20 feet stroke and four inch metal, weighing some 12 tons, being strong enough to stand the heaviest blast.

The pump rod is made of 14-inch square timber, heavily braced with iron straps, and extends to the bottom of the shaft. The enormous weight of this rod is counterbalanced with balance bobs, stationed every 500 feet in its length.

The engine, with line of pumps, bobs, etc., weighs something over 500 tons, and will cost the mine when put in place about \$400,000. The foundations for this machinery are of the heaviest and most substantial character, being made of cut stone upwards of 30 feet in depth.

The entire machinery has been constructed under the immediate direction and supervision of Mr. Geo. W. Pogg, the Superintendent of the Pacific iron works, to whose skill and efficiency the company are largely indebted for the superior character of the work and the unprecedentedly short time in which the order has been executed; the work having all been done

and shipped inside of 90 days. Messrs. Rankin & Brayton, the proprietors of these works, have recently added largely to the capacity of their establishment by the erection of new buildings and the addition of new and improved machinery, so that it is now one of the largest and best equipped in this country.

The Mechanics' Fair of 1876.

California is, according to all accounts, very poorly represented at the Centennial. The richest States in the Union, the State whose progress and development are entirely without a parallel in this history of the world, whose riches and products of all kinds are not reached by any other, has left the chances untaken to show fully to the world at large what industries can be developed, what prosperity can be gained in a congenial climate by a bold and enterprising population.

This is decidedly to be regretted, and our pride as Californians should feel considerably shaken. But still there is another chance left for us, a chance at home, to show to the people of the old world, who we hope will this year, in large numbers, pass over to our State, what the main nerve of California's prosperity consists in, to show them in a condensed form every branch of industry practiced here, and let them understand that we, the remotest of all States of the Union, are by no means the last in manufacture, intelligence and enterprise. We refer to the industrial fair to be held in San Francisco this year. Let every man in California help to make it a Centennial show of our own. Surely we have enough to exhibit. There is, before and above all,

Our Mining Interest.

Which should and must at all hazards be properly represented. Inventors and miners, patriotic you all are, show yourselves willing to spend something extra in favor of our Centennial exhibition. Send on the ores and all varieties of them from every mine in California. Let the manufacturers of milling machinery co-operate with the mine owners to have these ores worked and tested in their machinery before the people; make it a grand competition of riches and wealth, and a grand race of the genius of inventors and enterprising people in the mode of extracting them. Every phase of milling, from the receiving of the crude ores to the refining of the bullion, should be shown, and there would surely be no better chance for those who claim to have found superior methods of reduction to bring them before the people and have their inventions properly appreciated.

Hoisting and pumping machinery has another good chance at competition, and not only for competition, but for the admiration of intelligent men from all parts of the globe. Rock and prospecting drills may show their real merits, and we hope they may be represented in full numbers to join in a friendly race. But even the old arrastra process and Chilesen wheel into its latest improvements, the roller pan and giant wheel should not stay away; their working will be of the highest interest to visitors and of material benefit to exhibitors.

All Other Industries

Should be in proportion: powder and dynamite, sugar refineries, chemical manufacturers of all kinds, fresh and dried fruit, corn, wheat and other important crops, should be there, and we will have a show of the products of our own prosperous State that will spread the fame of California over the world, and make every Californian proud to belong to the most enterprising and enterprising State in the Union.

The Mindeff Process.

We have, in the Press of the 23d of May, thoroughly ventilated the question of the reduction of ores by the gas process; we have shown that so-called rebellious ores, that is, those containing copper and iron pyrites, are not affected by the gas; we have, of course, only spoken of copper and silver ores, never dreaming that an attempt on the credulity of the people might be made at gold ores. But we have still to learn. We conceded to the inventor all his theories, even the ones on sulphides of silver, which was promised by him to be practically proven for some time, but the idea of working rebellious gold ore by the gas process is so perfectly preposterous that we have to give it a slight ventilation.

Rebellious gold ores we call those in which the gold is found in iron or copper pyrites; but you must be aware that it always appears metallic, that it is not in a chemical combination, but free like all other gold ores, (we refer to an article on another page of the Press). Now, as the main and in fact the only point of the Mindeff invention consists in the metalization of metallic oxides—the pyrites are not affected by it—what does he do with his invention where he has metals direct? Does he claim a superior roasting furnace? We never heard of that, and surely the construction of the one at the works does not warrant such an assumption. As long as Mr. Mindeff, or any other inventor, keeps within the scope of legitimate investigations we are willing to do all we can to show the good points of their inventions, but when common sense even is so directly challenged it is our duty to give the warning.

G.

The South Yuba Canal and V Flume.

(From our own Correspondent.)

A canal 123 miles long, discharging 147,000,000 gallons (actual measurement) per day, is something not unworthy of notice; and such is the South Yuba canal, of Nevada county, Cal.

Tapping the South Yuba river about two and a half miles from the line of the Central Pacific railroad, this aqueduct winds its serpentine course southwest towards Bear valley, where it divides into two branches, the main arm running toward Nevada City, and the minor one toward Dutch Flat.

Of the main or Nevada City branch, about 120 miles consists of a wooden water course, known to miners as "fluming." This huge combination of boxes is carried over trestles, in some instances (as at Sleep hollow) to the height of 130 feet. Over another portion of the route engineering difficulties of a different character have been overcome. Running along the steep and rugged sides of the Sierras for some five miles, the canal stretches its course around the face of a perpendicular cliff 100 feet high, having its bed hewn in the solid rock, accessible to workmen only by means of slings and scaffolding.

The main ditch supplies many important mining camps. Among these are Chalk Bluff, Scotch Flat, Quaker Hill and Blue Tent. It also supplies the water works of Nevada City and Grass Valley, and the "V Flume" lumber canal.

The Dutch Flat branch of this South Yuba canal was built in 1864, and supplies a portion of the mines of Dutch Flat, Gold Run and other points. From this source alone this former town is supplied with 63,000,000 gallons of water daily. From Dutch Flat there is a partial connection with Auburn, and as the water is of the best quality, many engineers are of opinion that even San Francisco might be supplied from this source. It is certainly more feasible than the scheme of drawing such supplies from Lake Tahoe.

To guard against the lowering of this water level of the South Yuba river, the South Yuba canal company have erected several large reservoirs, one of which, although purely artificial, has secured the term of "lake." This is Meadow lake, which covers over one hundred acres, and has a capacity to the extent of 1,050,000,000 gallons. Fordyce dam is another reservoir of immense capacity. It is formed by damming up the South Yuba river at a point some 18 miles from Cisco. It is 45 feet deep and covers over one and a half square miles. It has a water shed of 15 square miles, and when completed will hold 5,000,000,000 gallons of water. These reservoirs enable the company to maintain 7,000 miners' inches of water in their canal throughout the year.

The South Yuba canal company was organized in 1852, by the consolidation or absorption of the Rock Creek, Gold Flat and Deer Creek ditch companies. This late lamented Charles Marsh was among the foremost spirits in this enterprise, and held the position of Secretary up to the time of his death. James Whartenby, Esq., has occupied the position of President ever since the inception of this company.

The V Flume.

This traveler on the Nevada City over the narrow gauge railroad can hardly fail to observe a long line of lofty trestle running from the Town Talk tunnel N. E. till lost to the view above this town. This is the so-called V flume, an aqueduct built by the Nevada and Grass Valley water and lumber company for the purpose of conveying water and lumber towards the latter town.

The length of the V flume is 16 miles, and in several instances it runs over a trestle 100 feet from the ground. It was completed in 1874, and consumed 1,000,000 feet of lumber and 30 tons of nails in its construction. It is capable of floating down the heaviest timber and has a capacity of 200,000 feet per day. Up at its junction with the S. Y. canal several saw mills are operated by its current; the largest of these is worked by a 14-foot "hurdy-gurdy" wheel, with a pressure of 344 feet and requiring 150 inches of water to move it.

The lumber region contiguous to this line of the V flume is extensive and is said to produce very superior timber. The new Nevada County railroad will no doubt add considerably to its importance. The owners of the S. Y. C. and V flume companies are not numerous, and we believe that none of the stock of either company has been in the market, or is likely to be.

J. Earl Brown, Esq., is the Superintendent of both interests, and combines in himself the best elements of the wide-awake business man and the courteous gentleman.

Answers to Correspondents.

F. J. Guss, Rye Valley, Oregon.—It is by no means the carbon which is troubling you in the arrastra. We will, in a later number, publish a complete description of the process. At present we have turned over your communication to Mr. E. G. Gaertner, M. E., No. 206 Front street, S. F., an expert who has our confidence, from whom you will receive all the information desired.

THE "HOME EDITOR" of the MINING AND SCIENTIFIC PRESS, unavoidably absent for several weeks, is expected back before our next issue.

Gems and Precious Stones.

(Written for the Press by HENRY G. HANES.)

(Continued from last week.)

E. Emerald, Beryl, Aquamarine.

These are varieties of the same mineral. They are silicates of alumina, containing glucina, with chromic oxide, peroxide of iron, lime, magnesia and tunic acid as impurities. The deep green varieties, colored by oxide of chromium, are called emeralds. Lighter shades of green or nearly opaque varieties are known as beryl, while a pure pale green or pale sky blue crystal is the aquamarine.

The common beryl is generally only imperfectly translucent, and owes its color to oxide of iron. Disregarding the minute quantity of iron or chromium which imparts the characteristic color to the varieties, the composition of pure beryl is as follows: Silica 66.8, alumina 19.1, glucina 14.1=100. Crystalline form, hexagonal. Hardness, 7.5-8. It may be scratched by a good file, but with difficulty, scratches glass easily and a quartz crystal slightly. Specific gravity 2.68. Fracture conchoidal. B. B. alone infusible—a thin splinter may, with great care, be rounded on the edges by partial fusion. With borax a transparent glass is formed with beryl and a deep green one with emerald. The powdered mineral dissolves in a bead of microcosmic salt without leaving a skeleton of silica. When heated to redness and thrown into water the emerald falls to pieces. It is not acted on by acids.

The most celebrated locality where the emerald is found is in the United States of Colombia, State of Boyaca, at the emerald mines of Muzo, near Santa Fe de Bogota.

These mines were worked for many years by a French company, whose lease expired in the year 1874. A large quantity of emeralds, and of great value, have been taken out of the principal mine. The stones were all sent to Paris to be cut. The emeralds occur in so minute and lie in bunches, or what would be called pockets in a gold mine. Sometimes months pass without any being found, while sometimes 100,000 carats are found in a few days. It is found to be very difficult to estimate the value of an emerald before it is cut; much depends on the depth of color and freedom from flaws. A stone of deep color, free from flaws and perfectly transparent, may be worth \$100 per carat, while some of inferior quality are sold very cheap. A French traveler discovered, in the mountains of Zaharah, in Egypt, an ancient mine of emeralds, which shows signs of having been extensively worked. This was no doubt the source from which the ancients obtained the emerald.

History shows that the emerald was known in remote ages. Necklaces of emeralds have been found in Etruscan tombs. This stone is mentioned in the Bible, and it has been shown that both the emerald and beryl were among the precious stones in the breast plate of the high priest.

In ancient Peru the emerald was used in the worship of the goddess Esmeralda, who was believed to reside in an enormous emerald of the size of an ostrich egg. The priests induced the people to present offerings of emeralds to this deity, which led to the collection of great numbers of these gems in the temples. At the conquest they all fell into the hands of the Spaniards.

A perfect emerald may be regarded as a wonderful production of nature; this fact is so well known that the expression "an emerald without a flaw," is proverbial and is taken in a double sense, being used to express the idea that perfection is almost unknown.

The emerald ranks next in value to the ruby. In England a stone possessing the requisites of the educated taste of amateur is worth from \$100 to \$200 per carat. The value of the emerald does not increase in the ratio of the diamond or ruby.

The aquamarine was formerly very valuable, but it is not so at the present day, having gone out of fashion.

Beryls are found in several localities in the United States. The most celebrated is Acworth, New Hampshire, where gigantic crystals have been found; one weighed over 300 pounds. Beryl may be looked for in granite rocks, and the emerald in clay slate, in which matrix it is found in the celebrated mines of Muzo, mentioned above.

Fine specimens of aquamarine have been brought to California from the deserts of Arizona, where they occur with other precious stones. A very fine specimen is one in the collection of the State University at Berkeley. Where such fine aquamarines are found it is worth while looking for emeralds, and I hope to hear of their discovery in that country.

Tourmaline, fluor spar and apatite are sometimes sold as emeralds, but they do not possess the physical properties of the true emerald. A paste imitation is made which can hardly be distinguished from the emerald.

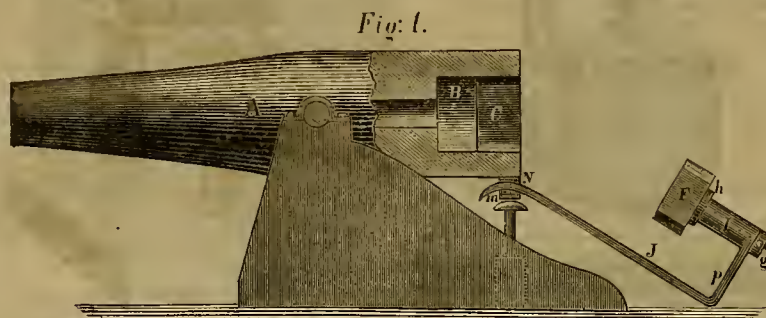
Prior to the opening of the Centennial exhibition, it was feared that poor accommodations and exceedingly high charges would universally prevail at the Philadelphia hotels during the Centennial, but by reference to our advertising columns it will be seen that one of the most commodious, conveniently located and well recommended hotels in that city offers very reasonable rates. We allude to the Park View hotel.

Owen's Breech Loading Ordnance.

As an important Pacific coast invention we place before the readers of the MINING AND SCIENTIFIC PRESS the following description of a new device for breech loading guns of heavy caliber. The invention was made in Nevada and patented through Dewey & Co.'s Patent Agency. It is well described in the patent as follows:

This invention relates to an improved arrangement or device for loading cannon of all kinds through the breech; and it consists of a peculiar interior configuration of the breech of the gun, together with a breech-key, so shaped as to enter the breech by a direct movement from the rear, and then by a quarter turn close and lock the same securely.

In the accompanying drawings, A represents a cannon having any desired construction of barrel and bore. The breech arrangement consists of a key-chamber, B, at the base of the bore and key-slot C. The key-chamber is a cylindrical space formed within the breech of the gun immediately behind the powder-chamber, with its axis coincident with that of the bore. Its transverse diameter is much greater than that of the bore, and its axial depth should be sufficient to accommodate a block of metal capable of resisting effectually the rearward impact of the charge when the gun is fired. The angular recesses within this cham-



OWEN'S BREECH LOADING ORDNANCE.

ber should be rounded in slightly for obtaining greater strength along those lines. The key-slot C is an oblong opening leading directly through the cascabel at the rear end of the gun along its axis into the key-chamber. Its length or greater diameter, which, for obvious reasons, should be placed vertically, is precisely equal to the diameter of the key-chamber, while its width or lesser diameter is considerably less, though still a little greater than that of the bore. Its axial depth should be a little more than that of the key-chamber, about three times the diameter of the bore being deemed a fair and full allowance for the united depth of both chamber and slot. Where this slot enters the key-chamber two stout shoulders, d, d, of solid metal are left, one on each side of the slot,

used each shell is made to serve that purpose. The thickness of the head block in the axial direction is made to correspond with the axial depth of the key-chamber, so that when it is pushed home, and a quarter turn given to it, the inclined surfaces on its posterior face gliding upon those of the shoulders of the breech cause it to bind firmly in a fore and aft direction within the key-chamber, thus securely closing and locking the breech of the gun.

A guide or carrying frame is also herein illustrated, which is probably the most convenient and simple device for the purpose on guns of ordinary weight and caliber; but for very heavy guns a radical modification of this arrangement has been devised, and might be substituted with advantage.

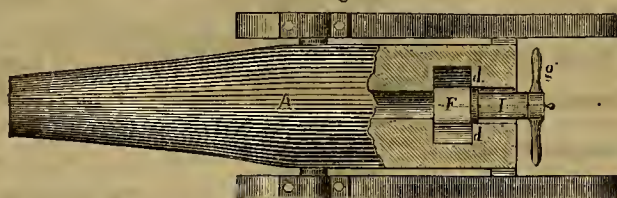
This carrying frame consists of, first, a collar or a swivel-barrel, I, which embraces the stem E of the key over its whole length, from the head-block to the handle, so as to hold the key steadily while it turns freely on its axis in the collar; second, a slide or guiding stem, J, which is somewhat longer than the collar I, and which moves freely in and out under the gun on a friction-roller, M, which is secured in a bracket, N, fastened to the under side of the breech; and, third, an upright part, P, which connects the two preceding parts, and holds them firmly in position parallel with each other. The extreme front end of the slide E is curved downward like a claw, and should be so shaped as to catch upon the friction-roller when the slide is drawn backward to its full length, and pre-

Fig. 1.

vent its complete separation from the bracket, while it allows the rear end, with the key, to drop down and rest upon the ground or hang upon the roller. In this position the gun is ready for loading, which may be accomplished very conveniently by means of a tray with a very thick bottom, and a movable handle held loosely in a collar at its rear end. Upon this tray the charge is introduced into the breech through the key-slot, and then by means of the tray-handle, used as a rammer, pushed forward out of the tray and into the bore of the gun. The tray is then removed and the key lifted and pushed home, where by a quarter turn upon its axis it locks the breech, and the gun is ready for firing.

The firing may be effected by means of a per-

Fig. 2.



OWEN'S BREECH LOADING ORDNANCE.

with their faces looking forward into the chamber. These faces are finished by giving to each a true spiral inclination of a low degree of pitch around the axis of the chamber. The breech-key consists of a stout stem, E, carrying upon its front end an oblong solid head-block, F, which is fixed upon it transversely, while upon the other end is fastened transversely to the block a lever-handle, G, by which the key is moved and turned. For the sake of greater strength the stem and head-block should be wrought together in one solid piece of metal, preferably of steel, but the handle need only be keyed upon the stem. The head-block of the key is shaped to fit and fill the key-slot somewhat loosely, so as to pass easily through it either into or out of the key-chamber.

The front face of the head-block is made plain and level; but its rearward face has a circular projection, H, rising from its central portion equal in diameter to the width of the block, from the center of which projection the stem, E, of the key issues. The surfaces of this face, nearer the ends of the block, are finished in true spiral inclines to correspond with the inclined faces of the shoulders in the breech, upon which they are made to glide and bind when the block is turned toward a transverse position in the key-chamber. These spiral inclines run out upon the sides of the central projection of this face without joggling or interfering with each other.

For a gas-check, where metal shells for the powder are not used, the bottom of the bore should be turned out so as to receive a ring of suitable metal, and the rearward edge of this ring should project very slightly into the key-chamber, so as to bear the impact of the front face of the head-block when the breech is strongly locked, but where metal shells are

How Valuable Mines Should be Recognized, Prospected and Worked.

(For the Press by E. G. G.—No. 3.)

It will now be in place to consider the different classes of ores found in nature.

1. Gold Ores.

There are but two varieties of gold ores found.

A. Metallic Gold.

Its specific gravity is 19 to 19.65. It can be dissolved only in nitro-muriatic acid and can be precipitated out of its solution by sulphate of iron. In nature it is rarely found pure, but generally alloyed with more or less silver; this percentage of silver gives rise to the expression, the fineness of the gold is so much, taking 1,000 as a basis and subtracting the percentage of silver in the alloy by weight. One ounce of fine gold (1,000 fine) is worth \$20.67. The U. S. gold coins are 900 fine.

The chemical properties of the gold, its unchangeability in the atmosphere, in water and simple acids, its non-oxidizing in fire and its fine color and malleability, make it, aside from its international use, one of the most valuable metals.

B. Sylvanite (Telluride of Gold).

The color of this metal is light steel gray, scratch grey, hardness 1.5 and specific gravity 5.7. Its composition is tellurium 59.40, gold 26.30, silver 14.30.

An easy test for telluride is its quality to give in concentrated sulphuric acid with gentle heating a fine red solution, which discolors upon water being added, and gives a gray precipitate. However, the existence of this variety is still disputed, some alleging that by microscopic analysis it is evident that the gold and tellurium are only mechanically mixed.

This is also the case in the gold bearing copper and iron pyrites or sulphurets. It is an opinion widely spread that the gold contained in them is some other composition; to the contrary it is all metallic gold and of no chemical combination with the sulphides of iron or copper surrounding it. The mode of working it we will explain at a later day.

Several subordinate varieties of gold ores are too rarely found and too difficult to distinguish to be taken into our enumeration. Certain it is that gold appears only metallic and pure or alloyed with silver, platinum and tellurium.

The ordinary test for gold is on this account very simple. Spooning or washing in a horn spoon after dry pulverization is the best mode. This has come to us from Mexico, and every miner on the coast is versed in the use of the spoon. Panning is used for the testing of auriferous gravel and just as well known. If you have sulphurets which are a great hindrance to seeing the gold and sometimes contain it in very minute particles, it will have to be roasted until all the sulphur in shape of sulphurous acid has evaporated, when the washing can be done by the spoon and the gold will be readily seen. Its peculiar bright yellow color makes it easily distinguishable from mica and iron pyrites.

The assaying of gold ores in a simple manner we will give, together with that of silver ores, in a later number.

Mechanics' Institute.

On the evening of June 10th, the recently elected trustees of the Mechanics' Institute were installed by N. W. Spanning as follows: A. S. Hallidie, H. L. Davis, George Spanning, Asa R. Wells, James Dimry, J. E. Setson and James Spiers.

After the installation the Board of Trustees met and elected A. S. Hallidie, President; P. B. Cornwall, Vice President; H. L. Davis, Treasurer; D. E. Hays, Secretary, and James Spiers, Corresponding Secretary.

The annual report of President Hallidie was presented at the meeting. In it he called attention to the advisability of securing a new location and erecting thereon a new building for the use of the Institute. The report shows that during the past year 5,664 volumes have been added to the library, which, added to the number of books, as per last report, will make a total of 27,266 volumes. The number withdrawn from the library averages 7,840 per month, or 94,080 annually.

During the year, 723 ordinary and 10 life members have joined the society, and the total number of members is estimated at 2,000.

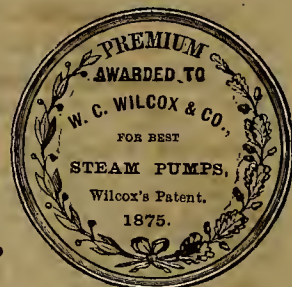
The receipts in the general fund during the year amounted to \$41,273.92; \$6,755.15 was obtained from membership dues; \$17,000 was borrowed from the Union Insurance Company, \$2,050 received from life membership dues, and \$5,316 from the last industrial fair. The disbursements from the same fund amounted to \$40,188.20, \$12,466 being paid out for books, and \$7,561 for improvements and repairs. This leaves a balance of \$1,085.72 in the treasury. The receipts in the sinking fund amount to \$3,128.40 and the disbursements \$1,444.50, leaving a balance in the fund of \$1,683.90. The gross assets of the Institute are placed at \$119,825.35 and the liabilities \$22,567, leaving as net assets the sum of \$157,258.35.



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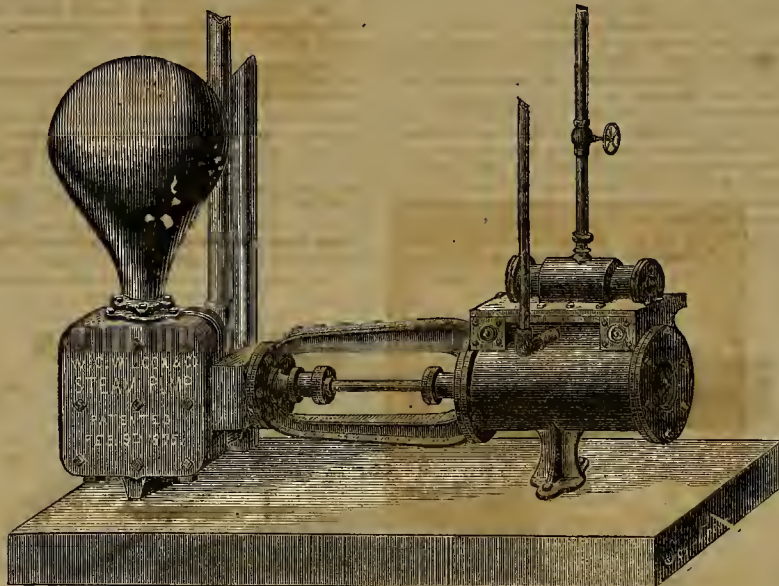
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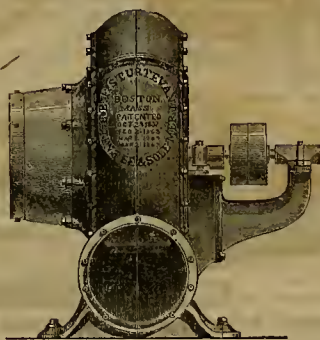
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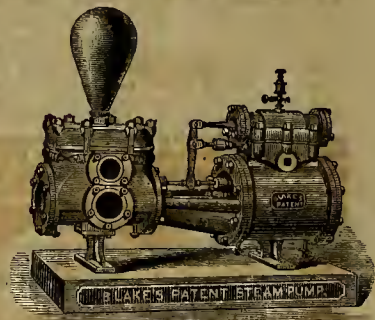
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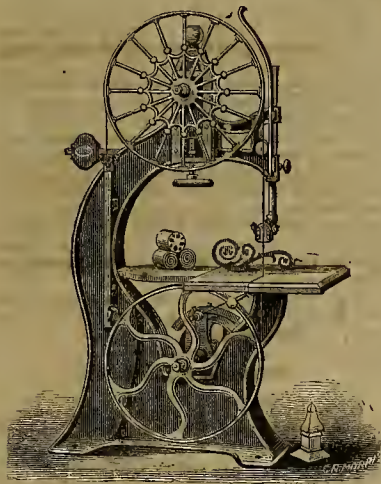
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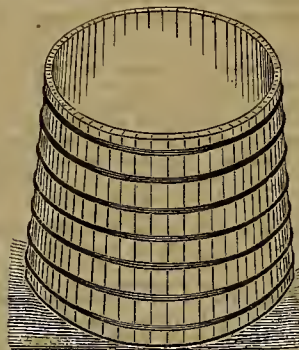
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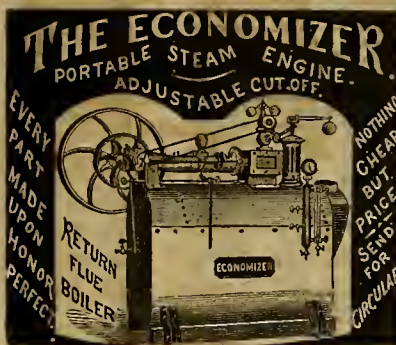
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cost is decreased by 20 per cent.The furnace is now working successfully at the Poe
Consolidated Co.'s mines, in the Peavine District. For
further information, apply toD. J. O'HARRA,
Reno, Nevada.

The Ingersoll Rock-Drill



Is Extensively Used in the East and

TAKES THE PLACE OF ALL OTHERS,

Wherever introduced, because it can be run with less
power, labor and repairs, and do more work than any
other Drill in the market. It has but few parts, is eas-
ily handled, being light, and HAS AUTOMATIC FEED,
which saves labor. WE ASK FOR TRIAL AGAINST
ANY COMPETITOR. For particular information re-
garding Drills or Air Compressors, send for circular toJ. B. REYNOLDS,
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Manufacturers of
Barnes' Patent Foot Power
Machinery, Scroll-Saws,
Circular Saws, Lathes, etc.
The only Foot Power Machine without
crank or dead centers, \$1,500 to \$2,000
per year made using these Ma-
chines. Send for Illus'd Catalogue
Rockford, Winnebago county, Ill.**PHELPS**
Manufacturing Co.,MANUFACTURERS OF ALL KINDS OF
Wharf and Bridge Bolts, Railroad Trestle
Work, Car Frames and Bolts, Machine
Bolts, Set Screws and Tap Bolts,
Lag or Coach Screws.ALL STYLES OF FANCY HEAD BOLTS.
HOT AND COLD PRESSED HEXAGON AND SQUARE
NUTS, WASHERS, BOLT ENDS, TURN-
BUCKLES, ETC., ETC.13, 15 & 17 Drumm St., near California,
SAN FRANCISCO, CAL.**SODIUM AMALGAM.**I am prepared to furnish Sodium Amalgam for \$1.50
per pound. Although the price is low, my reputation is
a guarantee of its purity. Sodium being now much
cheaper than formerly, the miner and millman should
have the advantage of it. The temptation to adulterate
the article being so great, consumers are advised to
call for my manufacture when ordering from wholesale
dealers, with an assurance on my part that the quality
will be the best. Zinc is sometimes substituted for
sodium, to the great disadvantage of the consumer.
The following are the tests for pure Sodium Amalgam:
Shaken up with water it must be wholly decomposed,
the mercury remaining perfectly fluid and the water
becoming strongly alkaline.HENRY G. HANKS,
619 Montgomery Street, San Francisco.ROASTING OF GOLD AND SILVER ORES, and the Extrac-
tion of their Respective Metals without Quicksilver,
1870. It contains 142 pages, embracing illustrations of
furnaces, implements and working apparatus. Price
\$2.50 coin, or \$3 currency, postage free. Published and
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BRASS and BELL FOUNDRYSAN FRANCISCO,
MANUFACTURER AND IMPORTER OF
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BRASS CASTINGS of all kinds,
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The Best and Most
Durable in use. Also,
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For Mining Purposes.
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ALL KINDS OF
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FACTORY, Berry street, bet. 4th and 5th, S. F.

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INDESTRUCTIBLE; NON-CONDUCTOR OF HEAT
Saves 15 to 30 per cent. in Fuel.REFERENCES: U. S. Government buildings and principal
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the Pacific slope; principal mines and mills in Nevada.

Agents for H. W. JOHNS' Patent

Asbestos Roofing and Paints

FIRE and WEATHER PROOF;

Asbestos Steam Packing,

Made from Pure Long Fiber Asbestos,

INDESTRUCTIBLE! SELF-LUBRICATING!

Keefe's Boiler Compound,

Prevents the formation of Scale in Boilers and removes
the same, saving the iron or
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The undersigned, owners of LESCHOT'S PATENT
for DIAMOND POINTED DRILLS, now brought to the
highest state of perfection, are prepared to fill orders
for the IMPROVED PROSPECTING and TUNNELING
DRILLS, with or without power, at short notice, and
at reduced prices. Abundant testimony furnished of
the great economy and successful working of numerous
machines in operation in the quartz and gravel mines
on this coast. Circulars forwarded, and full infor-
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With Solid Heads. These
screws have excellent thread
and highly polished solid
heads. They are economical
and durable. They can be
used repeatedly, as the heads
are not injured by the clipping
of the screw driver. For all
purposes they are far superior
to copped screws. Manu-
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JOHN TAYLOR & CO.,

IMPORTERS OF AND DEALERS IN
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We would call the special attention of Assayers
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Chemical Apparatus,

Having been engaged in furnishing these supplies since
the first discovery of mines on the Pacific Coast.
Our Gold and Silver Tables, showing the value
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Nevada Metallurgical Works,

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Ores worked by any process.

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Assaying in all its branches.

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Plans furnished for the most suitable pro-
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Special attention paid to the Mining and
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Instructions in Assaying,

Chemical Analysis, Determination of Minerals, and
use of the Blow-pipe.

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Will receive a few pupils at his new laboratory, 617
Montgomery street, up-stairs. TERMS MODERATE

QUICKSILVER FLASKS,

Tested to 1,000 lbs. per Square Inch,

For Sale in Lots to Suit, by

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STRONG & CO.,

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ASSAY OFFICEChemical Laboratory and Bullion
Melting Rooms.Thomas Price (formerly of the San Francisco
Assaying and Refining Works), having fitted
up the old Pacific Mail Building, No. 524 Sac-
ramento street, corner Lsidesdorff, as an Assay
Office, Chemical Laboratory and Bullion room,
is now prepared to make assays of the precious
and useful metals and their ores, as well as
complete or partial analyses of all minerals,
salts, waters or other substances that may be
desired, and is prepared to receive deposits of
Bullion for melting into bars, refining, parting
and coining.Special attention being paid to the treatment
of Base Bullion, and he hopes that his long res-
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entitle him to a reasonable portion of the busi-
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dress G. STINSON & Co., Portland, M.

PATENTS & INVENTIONS.

A Weekly List of U. S. Patents Issued to Pacific Coast Inventors.

FROM OFFICIAL REPORTS FOR THE MINING AND SCIENTIFIC PRESS, DEWEY & CO., PUBLISHERS AND U. S. AND FOREIGN PATENT AGENTS.]

By Special Dispatch, Dated Washington, D. C., June 13th, 1876.

FOR WEEK ENDING MAY 30th, 1876.*

HORSE BOOTS.—Hiram B. Cook, S. F., Cal.
AMALGAMATORS.—Lafayette Hinckley, S. F., Cal.

SURFING.—Pemberton B. Horton, S. F., Cal.
CAR AXLE LUBRICATORS.—James M. McDonald, S. F., Cal.

PLOWS.—Gideon J. Overshiner, San Jose, Cal.
MACHINE FOR PUNCHING AND SHEARING METAL.—Ira S. Van Winkle, S. F., Cal.

KEY-HOLE GUARDS.—John La Blanc and Harry St. Pierre, S. F., Cal.

STENCH TRAPS.—Charles W. Garland, S. F., Cal.
BALING ROPES.—George D. Jewett, Oakland, Cal.

REISSUE.

BEN LOUNOES.—John Hoey, S. F., Cal.

TRADEMARK.

CANNED FISH.—H. S. Crocker & Co., S. F., Cal.

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s Scientific Press American and Foreign Patent Agency the following are worthy of mention:

RAILWAY CARRIAGE.—Emanuel Blochman, S. F. The object of this invention is to provide certain improvements in railway carriages, and they are more especially applicable to those carriages which are intended for the cheaper classes of travel. In those cars which are intended for second-class and emigrant passengers very little accommodation is usually found for the travelers, and when long journeys, such as a transcontinental one from the East to the Pacific slope are to be made, much suffering is often occasioned. Mr. Blochman's invention contemplates the accommodation of more passengers, and at the same time providing all of them with sleeping accommodations at night.

The car employed is one in which part of the floor which lies between the trucks is lowered so as to give a considerable height, and this height is divided into two stories, so as to give two series of seats, one above another. The passages on the lower floor are made along the sides and the upper passage is made in the center. The seats on the lower floor are placed longitudinally, back to back. This arrangement brings the seats beneath the passage, so that there will be plenty of room for those sitting, while the seats in the upper part being situated above the side passages will thus allow of those passengers being made high enough for the purpose of walking. The upper passages, being centrally located, will be beneath the raised roof and give ample height in this part. The seats have extensions, which may be raised at night so as to stand on the same plane with the seat, thus making it broad enough for a bed for two. Beneath the seat is a folding extension, which, being laid horizontally, will be on a level with the raised floor, and this surface gives a bed for two more. The backs of the seats are hinged at the top to a suitable frame, which may be made to slide up on upright timbers between each section, so as to elevate it to a suitable height above the seat. The back may thus swing out and its outer edge supported by hangers from the ceiling. This gives another bed, so that there will be three tiers of berths, one near the floor formed by turning down the extension, one formed by the seat and its extension, and the third by turning up the wide back so as to lie horizontally above the seat. On the upper floor the seats are provided with backs which may be turned down, being hinged at the bottom, so as to lie on the same plane with the seat behind it, and these will form roomy beds for those passengers who occupy this floor. Access may be had from the ends of the seats to the lower central floor by a short flight of steps. Ample arrangements are made for ventilating all parts of the car, and the inventor is enabled by his method of construction to accommodate at least 70 per cent. more passengers than by the ordinary way, and at the same time give more than one-half of the passengers a place to lie down and sleep at night.

AFFAIRS IN CUSTER.—A gentleman direct from Custer, says the *Denver Tribune* of May 31st, informs the Nebraska press that the people there could not remain. The road from Laramie to Custer is swarming with Indians, and he does not believe it can be kept open. No confidence is felt in Crook's expedition for immediate relief. It is believed by this informant that the people now there will make their way out of the country by way of the Missouri. He received a wound in the hip from an attack on the train with which he came out.

Pleasant and Satisfactory.

HAMILTON, N.Y., May 28th, 1876.

To Messrs. Dewey & Co., Patent Agents:

GENTLEMEN—I write to acknowledge the receipt by express of the U. S. letters patent on my invention for breech loading ordnance, and to tender you again my very sincere thanks for the careful attention you have bestowed upon my application since I first placed it in your hands for the evident great interest you have manifested in it, and for the uniform patient and cheerful courtesy which has constantly marked your correspondence in reference to it. I have had some dealings with other agencies in the same line in times past, and I can assure you that my correspondence with you has been more pleasant and satisfactory than with any others, and I shall always take great pleasure in recommending your agency to any and all my acquaintances without hesitation or reservation, as I should certainly prefer to entrust my own business in your hands should I have any to transact in the same line hereafter. Yours, etc., J. R. N. OWEN.

Our Agents.

OUR FRIENDS can do much in aid of our paper and the cause of practical knowledge and science, by assisting Agents in their labors of canvassing, by lending their influence and encouraging favors. We intend to send none but worthy men.

J. L. TEARS—San Francisco.
B. W. CROWLEY—California.
G. W. MCGHEE—Santa Clara county.
J. M. MCARTHUR—Los Angeles, Santa Barbara, Ventura, San Bernardino and San Diego counties.
A. C. ENOX—El Dorado county.
F. A. SCOTFIELD—Sonoma county.
O. N. WISE—Santa Cruz county.
CHAS. E. SAJOUS—Philadelphia.

NOW'S THE TIME.—Everybody interested in mining and agriculture should subscribe for the Centennial year for either the *RURAL* or the *SCIENTIFIC PRESS*, published by Dewey & Co., San Francisco. They are the best journals of the kind in this country, and deserve the support of all those whose cause they espouse. Everything of interest connected with the Centennial, appropriate for these papers, will be collected. Send in your names.—*Mountain Messenger*.

PLACERVILLE, June 7th, 1876.

MR. JOHN L. BOONE:

Dear Sir—Yours of the 5th inst. received this morning. I am glad to have occasion to express the feeling I have in regard to the handling of my patent applications by your firm. I am much gratified by your success, and more than satisfied by the expedition and promptness which has characterized the transaction of the business in every particular.

Respectfully yours, HILAND G. HULBURD.

THE EXPLORES', MINERS' AND METALLURGISTS' COMPANION.—Comprising a practical exposition of the various departments of exploration, mining, engineering, assaying and metallurgy, containing 673 pages and 83 engravings. By J. S. Phillips, M. E. Price, cloth, \$10.00; in leather, \$12; postage 50 cts. Sold at this office.

"SPEAKS WELL," ETC.—We would return thanks for an exchange and back numbers of the *MINING AND SCIENTIFIC PRESS*, published by Dewey & Co., of San Francisco, Cal. It is a well edited, interesting, and valuable journal, and speaks well for our Pacific neighbors.—*U. S. Mining and Manufacturing Journal*.

THE IRON which commonly prevails among people of unclean habits and impure blood, and usually induces the ordinary expedients for its removal, can be quickly expelled by a few shavings with GLENN'S SULFUR SOAP. Sold everywhere.

WOODWARD'S GARDENS embraces an Aquarium, Menagerie, Art Gallery, Conservatories, Tropical Houses, Menagerie, Seal Ponds and Skating Rink.

1776.

1876.

CENTENNIAL EXPOSITION.

PARK VIEW HOTEL,

Corner 29th and Poplar Streets,

Opposite Fairmount Park,
PHILADELPHIA.

This Extensive First-class Hotel consists of thirty (30) adjoining and communicating buildings, having a frontage on Twenty-ninth Street of 185 feet, and on Poplar Street of 375 feet.

The Buildings are partly pressed brick and partly Serpentine stone, entirely new, having been built for the purpose of handsome private residences, with all the modern conveniences, thus affording more comfortable apartments than perhaps any other hotel in the city. Every room is furnished with new and substantial furniture, consisting of Beds, Carpets, etc., and seven hundred (700) guests can be comfortably entertained. It will be seen that this Hotel furnishes unusual advantages for families or parties desiring contiguous suites of rooms, a feature which will especially recommend itself to Lodgers and other organizations. The Location of this Hotel is equal, if not superior, to any place in the city. There is easy and rapid access to the Exposition, to and from all the Railroad Depots, as well as to every portion of the city. It is situated on high ground, within 200 yards of and overlooking Fairmount Park, and in the immediate neighborhood of Girard College, Girard Avenue Bridge, Zoological Garden, Fairmount Water works, and Lemon Hill, the latter place being one of the most delightful localities in the Park where Musical and other Entertainments will be kept up by the city throughout the season.

All places of amusement and interest in any part of the city may be readily reached by the Girard Avenue Line and the Union Passenger Railway, the care of the latter running directly by the Hotel. All other Passenger Railway Lines at convenient distances.
Lodgings, per Day.....One Dollar.
Breakfast.....Fifty Cents.
Dinner.....Seventy five Cents.
Supper.....Fifty Cents.

No Mesits to be paid for unless ordered or taken. The Houses being built of brick and stone, are far less liable to fire than many of the wood structures now put up for Centennial purposes. There will be connected with the Hotel Private Watchmen, Fire-proof Safes, Biggame Rooms, etc., for the care and protection of property. The Hotel is supplied with Thirty Bath Rooms, with all modern appliances. Rooms may be secured in advance for any time during the Exposition. The Hotel will be conducted with the special view to accommodate visitors to the Centennial Exposition. Readers of this will please send for illustrated circular, free.

Dewey & Co. { 224 } Patent Agt's.

IRON PIPE.

Having been appointed Agents for the Washington Pipe Works, we are prepared to ship from store, Pipe and Fittings at the lowest market prices.

BERRY & PLAGE, San Francisco.

TREADWELL'S OLD STAND.

To Mining Companies.

A Mining and Civil Engineer of long experience, well acquainted with the superintendence of mines and mills, the projecting and construction of hydraulic works, machinery, etc., is open for re-engagement Apply to Messrs. Dewey & Co., of the MINING and SCIENTIFIC PRESS, 224 Sansome street, San Francisco, for reference, or to J. , Postoffice Box 533, Oakland, Cal.

PACIFIC RURAL PRESS.

A first-class 18-page Agricultural Home Journal, filled with fresh, valuable and interesting reading. Every farmer and ruralist should take it. It is immensely popular. Subscription, \$4 a year.
DEWEY & CO., Publishers.
No. 224 Sansome street, SAN FRANCISCO.

Mining and Other Companies.

Amador Canal and Mining Company—

Location of works, Jackson, Amador county, Cal.
NOTICE.—There are delinquent upon the following described stock, on account of a assessment (No. 1), levied on the eighth (8th) day of May, 1876, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
T. J. Gallagher, Trustee.....	16	20	750 00
James Rolph, Trustee.....	22	2600	7500 00

And in accordance with law, and an order of the Board of Directors, made on the eighth day of May, 1876, so many shares of each parcel of such stock as may be necessary, will be sold at public auction, at the office of said company, on Wednesday, the fifth (5th) day of July, 1876, at the hour of two o'clock P. M., of said day, to pay said delinquent assessment thereon, together with costs of advertising and expenses of the sale.
J. W. CLARK, Secretary.
Office, Rooms Nos. 1 and 2, 414 California street, San Francisco, Cal.

Cherokee Flat Blue Gravel Company—

Location of principal place of business, San Francisco, California. Location of works, Cherokee Flat, Butte county, California.
NOTICE.—It is hereby given, that at a meeting of the Board of Directors, held on the 8th day of June, 1876, an assessment, No. 36, of five cents per share, was levied upon the capital stock of the corporation, payable immediately, in United States gold coin, to the Secretary, at the office of the company, Room 13, No. 323 Montgomery street, San Francisco, California.
Any stock upon which this assessment shall remain unpaid on the 15th day of July, 1876, will be delinquent, and advertised for sale at public auction; and unless payment is made before, will be sold on Saturday, the 5th day of August, 1876, to pay the delinquent assessment, together with the costs of advertising and expenses of sale. By order of the Board of Directors.
G. H. BODART, Secretary.
Office, Room 13, No. 323 Montgomery street, Safe Deposit Building, San Francisco, California.

Hope Quicksilver Mining Company—Lo-

Location of principal place of business, San Francisco, California. Location of works, Unabara Mining District, Sonoma County, California.
NOTICE.—It is hereby given, that at a meeting of the Board of Directors, held on the 12th day of May, 1876, an assessment (No. 1) of three (3) cents per share was levied upon the capital stock of the corporation, payable immediately, in United States gold coin, to the Secretary, at the office of the company, Room 2, No. 408 California street, San Francisco, California.
Any stock upon which this assessment shall remain unpaid on the 15th day of July, 1876, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Monday, the 10th day of July, 1876, to pay the delinquent assessment, together with costs of advertising and expenses of sale.
JACOB HARDY, Secretary.
Office, Room 2, No. 408 California street, San Francisco, Cal.

Manhattan Marble Company of California.

Location of principal place of business, San Francisco, Cal. Location of works, Oakland, Alameda Co., State of California.
NOTICE.—It is hereby given, that at a meeting of the Directors, held on the 23rd day of May, 1876, an assessment (No. 9) of three dollars per share was levied upon the capital stock of the corporation, payable immediately, in United States gold coin, to the Secretary of the company at his office, Nos. 13 and 15 Fremont street, San Francisco, Cal.
Any stock upon which this assessment shall remain unpaid on the 15th day of July, 1876, shall be delinquent, and advertised for sale at public auction, and unless payment is made before, it will be sold on Monday, the 7th day of July, 1876, at 12 o'clock M., to pay the delinquent assessment, together with costs of advertising and expenses of sale.
L. L. ALEXANDER, Sec'y.
Office, Nos. 13 and 15 Fremont street, San Francisco, Cal.

Mariposa Land and Mining Company

of California. Location of principal place of business, San Francisco, Cal. Location of works, Mariposa County, Cal.
NOTICE.—There are delinquent upon the following described stock, on account of assessment (No. 5), levied on the second day of May, 1876, the several amounts set opposite the names of the respective shareholders, as follows:

Names.	No. Certificate.	No. Shares.	Amount.
Alexander & Co, J. B., Unissued		100	\$ 100 00
Adams, Thomas.....	1165	100	100 00
Adams, Thomas.....	A 3	50	50 00
Adams, Thomas.....	A 4	60	60 00
Brumagim, J. H.....	Unissued	30.0	3050 00
Brumagim, J. H.....	426	25	25 00
Brumagim, J. H.....	112	100	100 00
Brumagim, J. H.....	1113	100	100 00
Brumagim, J. H.....	1114	100	100 00
Brumagim, J. H.....	1116	100	100 00
Brumagim, J. H.....	1117	100	100 00
Brumagim, J. H.....	1118	100	100 00
Brumagim, J. H.....	1119	100	100 00
Brumagim, J. H.....	1120	100	100 00
Brumagim, J. H.....	1121	100	100 00
Brumagim, J. H.....	1122	100	100 00
Brumagim, J. H.....	1123	100	100 00
Brumagim, J. H.....	1124	100	100 00

Names.	No. Certificate.	No. Shares.	Amount.
Brumagim, J. H.....	1125	100	100 00
Brumagim, J. H.....	1126	100	100 00
Brumagim, J. H.....	1127	100	100 00
Brumagim, J. H.....	1128	100	100 00
Brumagim, J. H.....	1129	100	100 00
Brumagim, J. H.....	1130	100	100 00
Brumagim, J. H.....	1131	100	100 00
Bennett, N R.....	Unissued	100	100 00
Bogart, Jos. C.....	Unissued	700	700 00
Brumagim, Fred P.....	1137	100	100 00
Brumagim, Fred P.....	1138	100	100 00
Brumagim, Fred P.....	1139	100	100 00
Brumagim, Fred P.....	1140	100	100 00
Brumagim, Fred P.....	1141	100	100 00
Brumagim, Fred P.....	1142	100	100 00
Brumagim, Fred P.....	1143	100	100 00
Brumagim, Fred P.....	1144	100	100 00
Brumagim, Fred P.....	1145	100	100 00
Brumagim, Fred P.....	1146	100	100 00
Brumagim, Fred P.....	1147	100	100 00
Brumagim, Fred P.....	1148	100	100 00
Brumagim, Fred P.....	1149	100	100 00
Brumagim, Fred P.....	1150	100	100 00
Brumagim, Fred P.....	1151	100	100 00
Brumagim, Fred P.....	1152	100	100 00
Brumagim, Fred P.....	1153	100	100 00
Brumagim, Fred P.....	1154	100	100 00
Brumagim, Fred P.....	1155	100	100 00
Brumagim, Fred P.....	1156	100	100 00
Brumagim, Fred P.....	1157	100	100 00
Brumagim, Fred P.....	1158	100	100 00
Brumagim, Fred P.....	1159	100	100 00
Brumagim, Fred P.....	1160	100	100 00
Brumagim, Fred P.....	1161	100	100 00
Brumagim, Fred P.....	1162	100	100 00
Brumagim, Fred P.....	1163	100	100 00
Brumagim, Fred P.....	1164	100	100 00
Brumagim, Fred P.....	1165	100	100 00
Brumagim, Fred P.....	1166	100	100 00
Brumagim, Fred P.....	1167	100	100 00
Brumagim, Fred P.....	1168	100	100 00
Brumagim, Fred P.....	1169	100	100 00
Brumagim, Fred P.....	1170	100	100 00
Brumagim, Fred P.....	1171	100	100 00
Brumagim, Fred P.....	1172	100	100 00
Brumagim, Fred P.....	1173	100	100 00
Brumagim, Fred P.....	1174	100	100 00
Brumagim, Fred P.....	1175	100	100 00
Brumagim, Fred P.....	1176	100	100 00
Brumagim, Fred P.....	1177	100	100 00
Brumagim, Fred P.....	1178	100	100 00
Brumagim, Fred P.....	1179	100	100 00
Brumagim, Fred P.....	1180	100	100 00
Brumagim, Fred P.....	1181	100	100 00
Brumagim, Fred P.....	1182	100	100 00
Brumagim, Fred P.....	1183	100	100 00
Brumagim, Fred P.....	1184	100	100 00
Brumagim, Fred P.....	1185	100	100 00
Brumagim, Fred P.....	1186	100	100 00
Brumagim, Fred P.....	1187	100	100 00
Brumagim, Fred P.....	1188	100	100 00
Brumagim, Fred P.....	1189	100	100 00
Brumagim, Fred P.....	1190	100	100 00
Brumagim, Fred P.....	1191	100	100 00
Brumagim, Fred P.....	1192	100	100 00
Brumagim, Fred P.....	1193	100	100 00
Brumagim, Fred P.....	1194	100	100 00
Brumagim, Fred P.....	1195	100	100 00
Brumagim, Fred P.....	1196	100	100 00
Brumagim, Fred P.....	1197	100	100 00
Brumagim, Fred P.....	1198	100	100 00
Brumagim, Fred P.....	1199	100	100 00
Brumagim, Fred P.....	1200	100	100 00
Brumagim, Fred P.....	1201	100	100 00
Brumagim, Fred P.....	1202	100	100 00
Brumagim, Fred P.....	1203	100	100 00
Brumagim, Fred P.....	1204	100	100 00
Brumagim, Fred P.....	1205	100	100 00
Brumagim, Fred P.....	1206	100	100 00
Brumagim, Fred P.....	1207	100	100 00
Brumagim, Fred P.....	1208	100	100 00
Brumagim, Fred P.....	1209	100	100 00
Brumagim, Fred P.....	1210	100	100 00
Brumagim, Fred P.....	1211	100	100 00
Brumagim, Fred P.....	1212	100	100 00
Brumagim, Fred P.....	1213	100	100 00
Brumagim, Fred P.....	1214	100	100 00
Brumagim, Fred P.....	1215	100	100 00
Brumagim, Fred P.....	1216	100	100 00
Brumagim, Fred P.....	1217	100	100 00
Brumagim, Fred P.....	1218	100	

[illegible]

Iron and Machine Works.

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Near Howard, - - - SAN FRANCISCO.

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Hayes' Improved Steam Pump, Brodie's Improved Crusher, Mining Pumps, Amalgamators, and all kinds of Machinery.

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CAPITAL.....\$1,000,000.

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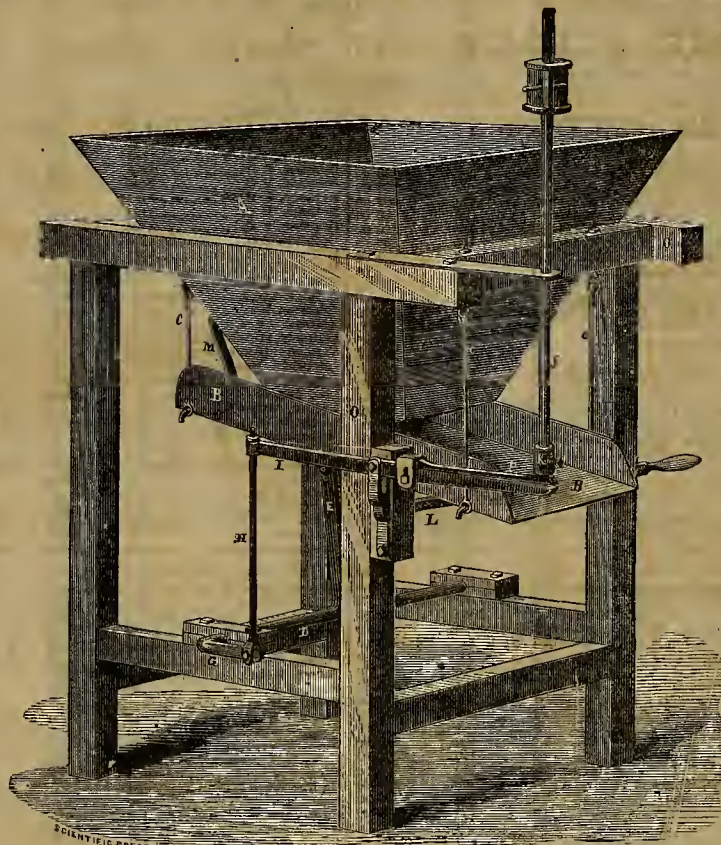
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The TULLOCH AUTOMATIC ORE FEEDERS have been practically tested during the last year and a half in twenty-seven mills, of from five to eighty stamps each, and have, in every case, given perfect satisfaction. Refer to the following Mills: California, Con. Virginia, Northern Belle, Leopard, Trench, Humboldt, Douglas, Phoenix, Hite, Crescent, and others. Prices Reduced. Send for Circulars.

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HAVE NONE OF THE FAULTS OF THE OLD CALORIC ENGINES, AND TEN TIMES THE POWER.

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ARE NOT LIABLE TO GET OUT OF ORDER.

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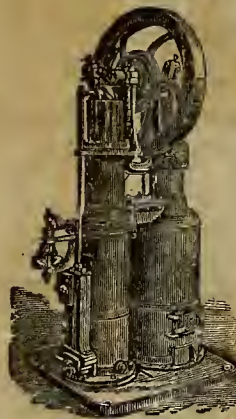
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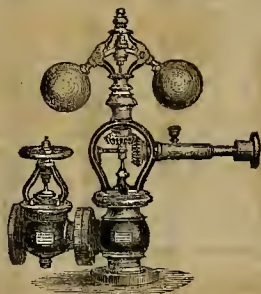
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Ventilating and Illuminating Tile,

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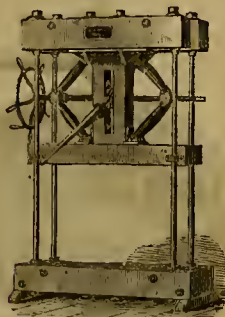
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Exhaust Fans.



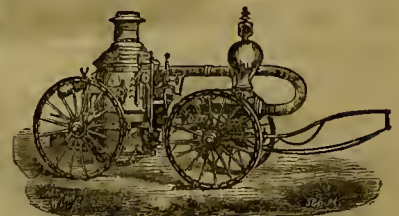
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For Wine, Cider, Lard, Etc.



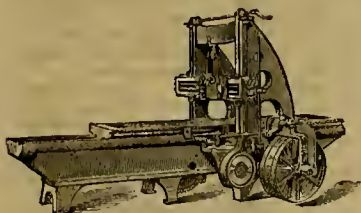
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1,000 Feet Single Lift, Guaranteed.



Waters' Patent Governor.



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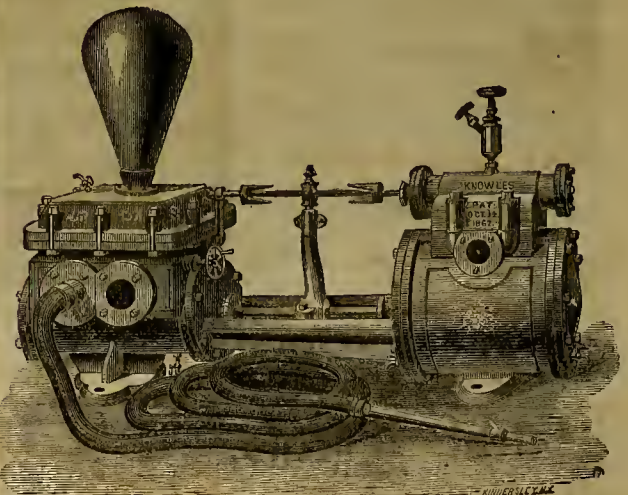


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THESE ARE THE ONLY PUMPS
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Knowles' Steam Pump; for all purposes where Pumping is required.

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DRILLING MACHINES.

PORTABLE DRILLS. Driven by power in any direction, self-feed and convenient adjustment.
RADIAL DRILLS. Self-feed—large adjustable box table—separate base plate, every convenience.
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Reducing and Concentration Machinery.

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SUCCESSORS TO EAGLE WORKS M.F.B. CO. MANUFACTURERS OF

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CRUSHING, ROLLERS, AMALGAMATING MACHINERY
FOR SYSTEMATIC MILLING, SMELTING, AND CONCENTRATION OF ORES

AGENTS FOR
BLAKE STONE BREAKER
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Hoisting Engines, Diamond Pointed Rock Drills,
Manufactured by M. C. BULLOCK.

California Planers and Matchers, and Wood Working Machinery of all Kinds

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Is gotten up from new patterns specially for this Coast. It has Cast Steel Slotted Cylinder Head, running in patent self oiling boxes; will plane 24 inch wide and six inch thick, and tongue and groove 14 inch wide. Will make rustic and stick gutters, or heavy mouldings, etc., and is the best job machine ever built. We have always on hand these machines with or without under cutter head, also, a large assortment of Planing Mill Machinery.



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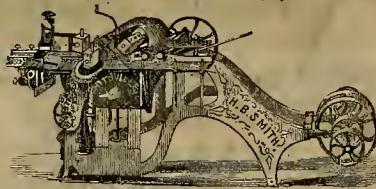


WITH LATE IMPORTANT IMPROVEMENTS.

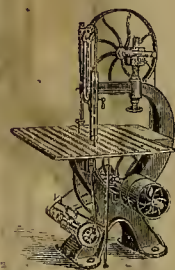
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We have four sizes of these Machines always on hand—"B," "C," "D" and "E,"—to work either three or four sides. Have slotted heads and all other improvements; and may be seen in any mill on the Coast. Prices reduced to 15 per cent. less than Eastern list. We have also, a large stock of all kinds of Planing Mill Machinery, such as Molders, Mortisers, Tenoners, Band and Jig Saws, etc. Send for our new illustrated Catalogue. BERRY & LACE, Selling Agents.



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Cook's Patent Automatic Boiler Feeder & Regulator.

Economy in Operation. Absolute Safety from Explosion.

SIMPLER THAN A PUMP, AS IT REQUIRES NO ATTENTION.

ECONOMY IN FUEL.

Entirely Automatic, Reliable & Durable.

Cook's Automatic Boiler Feeders

WERE AWARDED THE HIGHEST PREMIUM OVER ALL MACHINES EXHIBITED AS BOILER FEEDERS AT THE GIN- OINNATI EXPOSITION AND THE ST. LOUIS FAIR.

The cuts show the operation of the Feeder. It was described in detail in the MINING AND SCIENTIFIC PRESS of May 20, 1876.

This Feeder will discharge from 40 to 200 gallons of water at one movement, where a pump would require hundreds of strokes to do the same work.

The water is kept exactly at the proper line, whether running fast or slow, without attention from the engineer.

Feeders, Heaters and Regulators Combined are made on this principle. Simple and economical.

The control of feeding water to the boiler, is taken out of the hands of the engineer and left, to unerring natural laws.

These Machines are now introduced on this coast for the first time, although they are extensively used in the Eastern States. They supply the boilers with great regularity, and keep the water at exactly the same level. As a protection against explosion they are simply perfect, leaving nothing to be desired.

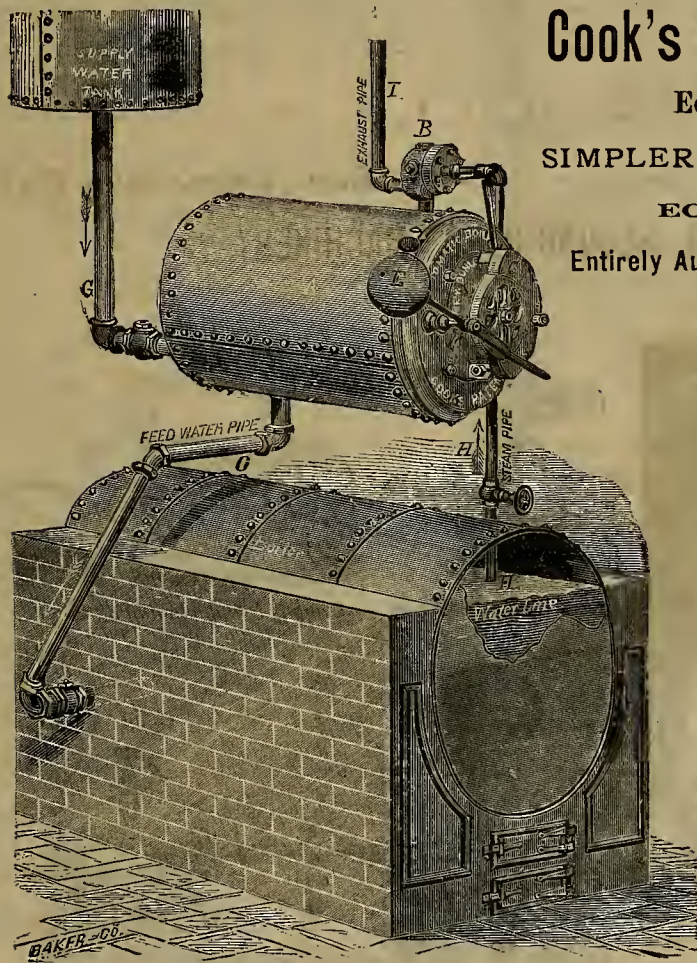
ONE OF THESE FEEDERS CAN BE SEEN IN OPERATION AT THE PACIFIC IRON WORKS.

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For Mining, Shipping, and General Purposes.

All kinds and sizes on hand, or made to order; guaranteed of unsurpassed quality, and manufactured of any length. FLAT ROPES, ROUND ROPES and TAPER ROPES, OF IRON OR STEEL.

Patent Endless Wire Ropeway

(WIRE TRAMWAY)

FOR THE RAPID AND ECONOMICAL TRANSPORTATION OF ORES AND OTHER MATERIAL OVER MOUNTAINOUS AND DIFFICULT ROADS.

This system has been in use for over three years and given thorough satisfaction.

PATENT GRIP PULLEY.

For transmission of power by means of wire ropes

WIRE.

Fencing Wire and Staples.

BALING WIRE.

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SEWING MACHINES.—We have a first-class machine we wish to dispose of on favorable terms. Apply at his office.

GALVANIZED WIRE.

BROOM WIRE.

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Full stock on hand in bond, or duty paid.

Wire Cloth and Wire Netting.

Full Assortment on hand for all Purposes.

—AND—

All Kinds of Goods in the Wire Line.

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PATENT DETACHABLE TOOTH SAWS.

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Assaying Taught.

Practical Instructions on General Analysis.

J. Phillips & Co.
EXAMINER OF MINES, MINERAL ASSAYER &c.
640 CLAY ST. S. F.

Author of Explorers', Miners', & Metallurgists' Companion, 672 pages, 34 illustrations. Price 2nd edition, \$10.50. Also, "WEE PET" Assaying Machine. Price, \$100.

SUTTER CREEK, February 26th, 1876.
Messrs. Dewey & Co.—I have received your Letters Patent through your Agency. And, for your promptness, accept my thanks. Yours,
S. N. KNIGHT.

MINING AND SCIENTIFIC PRESS.

An Illustrated Journal of Mining, Popular Science and General News.

BY DEWEY & CO.,
Patent Solicitors.

SAN FRANCISCO, SATURDAY, JUNE 24, 1876.

VOLUME XXIII
Number 26.

Some of the Mines of El Dorado County.

[By our own Correspondent.—No. 4.]

Before leaving Placerville, curiosity led me to examine one or two more porphyry mines. Mr. Naper, at Poverty Point, is one of your lucky miners that seems to have been born under favorable auspices. With a clairvoyance that seldom errs, whenever he feels so inclined he goes down into one of his pockets and seldom returns empty-handed. Call it good luck, judgment, science, what not; some make it pan out well, while others can scarcely raise the color.

Such is life. I set out to describe his claim—but it was so much easier moralizing a little than puzzling my brain over his miniature quartz veins, that I have come to the conclusion since he has done so remarkably well and has such a good little claim, to jump it, and pass on to the next in order, that of

H. M. Hodge,

In the same neighborhood, which would in all probability astonish Sir Charles Lyell himself. It has some peculiarities not found in the books. It is the business of your correspondent to record the facts; let the geologist reason from them. The lode is about four feet in width; an open outcrop has been run into the hill, following the vein and of the same width, showing perpendicular slate walls on each side. Quartz veins six to ten inches wide out the porphyry, pitching north at an angle of 45 degrees, and extend across the lode from wall to wall instead of along the walls as in one formerly described. These veins are from three to four feet apart, the intermediate space being filled with porphyry. There is a thin vein of quartz, not more than one-eighth of an inch thick, that cuts the other veins and the porphyry, dipping south at an angle also of about 45 degrees. The best pay ore is usually found at the end of the veins, where they come in contact with the west wall. The singularity of the formation is sufficient apology for the minuteness of the description. It pays well.

Crossing the South fork of the American river to Kelsey, Spanish flat and Garden valley, a perfect nest of quartz claims was encountered, some of which ought to be noticed. The first visited was

The Chaparral,

On the brow of a hill in full view of the river, some three miles south of the St. Lawrence. It is now being prospected by Messrs. Condo, Dickson and Pondstone, some Amador county miners. They have an incline down on the vein upwards of 50 feet, and are taking out some fine looking ore. The character of the rock is improving as they sink, having a more bluish cast, and will probably mill \$15 per ton. It looks very promising.

The Big Chunk Quartz Claim

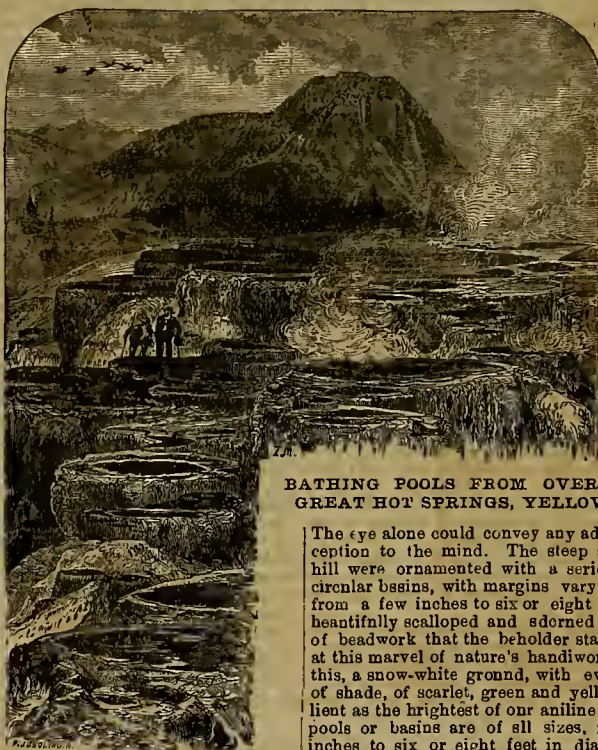
Is situated about one mile from Kelsey, at the head of Big Chunk ravine, which took its name from the fact that large pieces of quartz containing from \$3,000 to \$5,000 in gold were taken from it, resembling the rock from the ledge. Some of the ore at the shaft is of the blue ribbon character, which gives a fine prospect in the hand mortar, over \$3,000 having been taken out in this way in a single pocket. The owner of this property thought that the best rock would mill as high as \$30 or \$35 per ton, which did not seem improbable.

The Excelsior Mine,
On a parallel lode 200 feet distant, the property of Mr. C. F. Travis, of San Francisco, shows ore similar in many respects to that last mentioned. If I remember correctly three different lots of it were worked some time ago by Strong & Bro., metallurgists of your city, that yielded from \$8 to \$30 per ton. For the sake of my friend Travis I observed the ore and all the surroundings closely, and can see no reason why it may not be made to yield handsomely. It is a fine sulphuretted rock, some of the bluish cast and ribbon character, showing more or less free gold. It ought to be good milling ore.

Georgetown, El Dorado Co.

A Cheap Rock Breaker.

Mr. Charles H. Aaron's new book for practical miners, which is now going through the press and will be ready for distribution in a few weeks, contains many hints of great value which ordinary writers would probably overlook. He keeps cheap and simple mechanical devices for miners use prominently in view, and pays great attention to things by which the working miner without capital will be benefited. Among articles of this character described by him is a cheap rock breaker, a representation of which is given on this page.



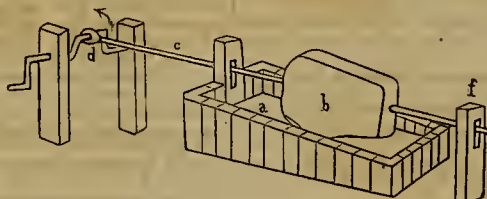
BATHING POOLS FROM OVERFLOW OF GREAT HOT SPRINGS, YELLOWSTONE.

Bathing Pools of the Yellowstone.

The accompanying engraving shows another of those interesting scenes in the Yellowstone country, which Prof. Hayden has described so pleasantly in his "Geological Survey of the Territories." The scene in question represents a general view of the overflow of a great spring on Gardiner's river. In describing it Prof. Hayden says:

Before us was a hill 200 feet high, composed of the calcareous deposit of the hot springs, with a system of step-like terraces which would defy any description by words.

In the engraving, *a* is an inclined table made of one or more pieces of rock, enclosed by a low wall or rocks or wooden legs. On the table rests a mass of rock, *b*, which is connected by an iron rod, *c*, with the crank, *d*; another iron rod, *e*, also fastened into the rock,



A CHEAP ROCK BREAKER FOR MINERS' USE.

b, passes through a slot in the post, *f*. The ore to be broken is thrown upon the table in front of the moving rock, which, by the rotation of the crank in the direction of the arrow, is lifted and drawn forward over the ore. As the crank continues its rotation, the weight of the rock and the sliding movement imparted to it crush the ore beneath it and cause it gradually to work out at the lower end of the table, when it may be transferred to a pulverizing barrel, or sifted and the coarser part reground in the machine. This is merely a suggestion, and improvement will doubtless be made by intelligent miners.

The California building at the Centennial was opened Wednesday.

yards in diameter, and many of them going to decay. Here we find the largest, finest and most active spring of the group at the present time. The largest spring is very near the outer margin of the terrace and is 25 by 40 feet in diameter, the water so perfectly transparent that one can look down into the beautiful ultramarine depth to the bottom of the basin. The sides of the basin are ornamented with coral-like forms, with a great variety of shades. These springs have one or more centers of ebullition, and in this group it is constant, seldom rising more than two to four inches above the surface. From various portions of the rim the water flows out in moderate quantities over the sides of the hill. Whenever it gathers into a channel and flows quite swiftly,

basins with sides from two to eight feet high are formed, with the ornamental designs proportionately coarse, but when the water flows slowly, myriads of little basins are formed, one below the other, with a kind of irregular system, as it might be called, which constitutes the difference between the works of nature and the works of art. The water holds a great amount of lime in solution. It also contains some soda, alumina and magnesia. The ebullition is largely due to the emission of large quantities of carbonic acid gas. As the waters flow down the sides of the mountain, they constantly deposit more or less of this calcareous sediment in almost every possible variety of form. Underneath the sides of many of these pools are rows of stalactites of all sizes, many of them exquisitely ornamented, formed by the dripping of the water over the margins of the basins.

Dissatisfied Stockholders.

Dissatisfied stockholders seem to be more common now-a-days than satisfied ones, but we are glad to see that in numerous instances the investigations which have taken place have been productive of benefit, and those charged with corrupt practices and mismanagement have been deposed from office.

Among the latest companies undergoing a sort of investigation are the South Chariot and the Newark. The South Chariot stockholders held a meeting last Saturday, and during their proceedings the Board of Trustees made a virtue of the necessity and stepped down and out, handing in their resignations. Three of these were accepted, and Joseph Naphtaly, L. Steinbert and Mr. Perin elected in their stead. Minar and Kannally, of the old board, were retained. Joseph Naphtaly was afterward elected President, and the Secretary and Superintendent were re-elected. The first proceeding was to save \$150 a month by cutting off the President's salary. He will receive glory and thanks for his services in the future. Other reductions will be made. It was decided not to interfere with the assessment now levied, as the company is in debt, and the new powers intend to start a new balance sheet.

The dissatisfied Newark stockholders also held a meeting on Saturday. The *Chronicle* says it was stated that the President received \$100 per month; Superintendent, \$400; Foreman, \$250; Secretary, \$200. All these items appear on the books, with \$25 for miscellaneous purposes. The Committee found on the books a charge of \$50 for moving the office. The "office" consisted of "six little books and one little box"—not one dray-load. Three horses are charged with \$50 worth of grain per month. The books are in such a condition that nothing can be made out from them. It was stated that the mill was doing outside work, no ore being taken from the mine, and running behind \$1,000 each month. Joseph Naphtaly related how the South Chariots had accomplished their ends, and stated that as the company was incorporated before the alteration in the Code, January 1st, 1873, only a majority of the stock need be represented, whereas if it had been incorporated after that date, it would require two-thirds of the stock. About 7,000 out of the 18,000 shares represented in the movement were turned in, and the meeting adjourned.

REPORTS from British Columbia state that miners were pouring into Dease creek, and all the old companies are making preparations to work their claims. Provisions are scarce. Flour, \$35 per barrel. The new strike lately reported on McName creek proved to be a very small one. The miners who took up ground soon abandoned it. Deep diggings are reported struck on Thibet creek. The Stikine river is still high.

It is estimated that 6,000 men have gone into the San Juan country and Southeast Utah since March 1st, says the Salt Lake Tribune, and it is thought the number will be increased to fully 10,000 before the middle of October. The mines and good agricultural lands are the cause of this stampede.

FORTY-FOUR cargoes of coal have been shipped from Seattle to San Francisco since January 1st, 1876.

CORRESPONDENCE.

[Editorial Correspondence.]

The Centennial at Philadelphia.—No. 6.

In continuing our reference to the exhibits in machinery hall we come now to
The Dominion of Canada.

Although this exhibit appears somewhat contracted on the diagram, it is nevertheless quite extensive, interesting and creditable, and is eminently suggestive of the region whence it comes. An array of boats and fishing tackle forms a prominent feature. Nova Scotia sends a small prospecting quartz mill, much after the "Stockton" pattern, as emblematic of a very important feature in her industry—that of mining. It is the only exhibit of the kind, save the Nevada mill, on the grounds. There is also a magnetic separator, for separating magnetic sands from those not magnetic. It is used in the separation of the titanic iron sands of Canada for metallurgical purposes, and might be successfully employed by the large placer mining companies in California in separating the heavy magnetic black sands from the lighter ones, which may be afterwards more readily washed away from the gold by the pan or rifle. Several spark arresters attract attention here, and near them may be seen a number of portable hot blast forges, brick, tile and pipe machines, numerous specimens of bar iron, and an ingenious type setting and distributing machine, which, it is claimed, has a capacity of from 12,000 to 15,000 ems per hour from undistributed type.

Germany.

Now, turning to the left of the Canadian exhibit, we come upon the German department, the most conspicuous object in which is a huge monumental trophy, 28 feet high, built out of her peculiar ores of iron and their white, large crystal product of spiegel Eisen pig, broken into small pieces. The display is very fine and is not equaled by any other exhibit of the kind. This peculiar quality of iron contains from 12 to 15 per cent. of manganese. It is used for making the best quality of Bessemer steel, by mixing in small proportions with other irons.

Another interesting exhibit is a new atmospheric gas engine, exhibited by Langer & Otto, which appears to have obviated much of the impracticability hitherto connected with gas engines, particularly the heating of those parts directly exposed to the force of the explosion, and in taking the work off the piston in its rapid upward motion and confining it exclusively to the pressure of the atmosphere in forcing the piston down. In ordinary gas engines the force of the explosion is mostly converted into heat and thus lost for effective use, while at the same time it works great detriment to the machine. I shall not stop to further describe this novel motor at this time, as I have been promised a full illustration of the same at an early day, which I shall forward to the Press.

A very ingenious device, designed for turning a drill, worked by a rope, in deep well sinking, is also shown by a working model, but cannot be satisfactorily described without illustrations. It is well known that ropes are much more convenient for use in such work than iron or wooden rods, and would save more than half the expense of deep well sinking if they could be practically used. Several ingenious appliances have been devised with that end in view, but without success. This seems to accomplish what is desired, viz., to turn the rope and drill in regular intervals of space, so as to make a straight bore. It certainly works perfectly in the model, but how it acts in a deep well may be quite another thing. If it will do what is claimed for it in practice, it is well worth the attention of extensive well borers everywhere.

Krupp is also here with one of his 1,600-pounder guns and several small ones from his mammoth establishment at Essen. As I write workmen are engaged in making preparations to place the large gun just inside the main entrance to the machinery hall. The ordinary plank floor is being covered by square 10-inch timbers, on which a new floor will be laid to accommodate the monster.

The Exhibit from Belgium,

Which, it will be seen by reference to the diagram with our last letter, may be found on the north side of the hall, and just beyond the French exhibit, corresponding to its geographical position on the map. The most monstrous thing in this exhibit is a huge well borer, the design of T. Claudrus, a Belgian civil engineer, and employed for boring and tubing mining shafts and wells below the water level. This much he consists of an enormous gallows frame, supporting a leg of iron, shod at its lower extremities with a row ten feet long of movable chisels, used to stamp or drill holes into hard rock. This leg, with its long row of chisels, being caused to move up and down like a monstrous drill, and being rotated six inches after every stroke, soon works its way down into the rock, forming a well-like vein in diameter. After the chisels have done their work, a velvet bucket or a grappling iron is let down, which scoops up the mud or frag-

ments of rock, and brings them to the surface. If a larger well or shaft is wanted, the machine is further provided with another large forked leg, containing two and a half feet of chisels on each side, the blank space straddling the ten foot hole already made. When this is set to work it cuts around the previous well and enlarges it to 15 feet in diameter. It seems at first sight as though this machine was made merely to show how much of a possible monstrosity could be put into such huge shape; yet the agent states in his circular that these machines have done a large amount of work, at a much less cost than it could have been done in the ordinary way of drilling and blasting. Forty-four different shafts are enumerated, located in France, Great Britain, Belgium and Germany, which have been successfully sunk by these machines, varying in depth from 115 to 760 feet, and in diameter from 10 to 15 feet. A gigantic tubing apparatus accompanies this exhibit, by which heavy cast iron sections of tubes two inches thick and 15 feet in diameter can be readily adjusted in the deepest shafts. Lighter tubes may of course be used when the ground and depth will permit. It is possible, according to the above record, that one of these machines might prove useful in California or Nevada.

Belgium also exhibits a double Corliss engine, built at the company's works in Providence. It is really a splendid machine, and the reception of such an order from the government of a country so far advanced in the art of engine building as Belgium, is a high compliment paid to the Corliss company and to American mechanical skill. We also have here beautiful machines for working wool, cotton and iron; also, two very fine carriages—one a double seated open carriage, and the other a single seated covered one. We have also multitubular filters, rotary pumps, gears and punching machines. This little country, by her exhibit, both here and in the main building, gives evidence that she is really what she is said to be—a beehive of artisans, in which there is scarcely any important branch of industry neglected.

Sweden.

One of the principal exhibits made by Sweden is in Bessemer steel. It is shown only in part in the building. Locomotives and car wheels made of this steel are shown which are said to have run 190,000 miles without being turned, and still show very little wear. The ordinary life of a locomotive wheel is from 60,000 to 80,000 miles. Railroad axles and car wheels are exhibited in the various stages of their manufacture, so conditioned as to show the superiority of the iron from which they are made—bent, twisted and hammered together in a cold state; drawn cold into knots; worked cold by means of powerful pressure and percussion under the steam hammer, etc., all of which is designed to show the excellency of the Swedish iron and steel—which deservedly stands ahead of all other productions of the kind in the world. Machinery for making castings is also shown. This set consists of eight pieces, all neatly made and effective, but not equal to that shown by the United States in the Government building. Circular saws and gaug saws are also shown, to remind us that Sweden is a lumber as well as an iron producing country. A number of cooking stoves, ranges and heating furnaces are also shown. Among the cooking stoves is a "rotary," quite similar to those used in this country 25 years ago. Her sewing machines have already been noticed.

The only foreign built locomotive, aside from a small underground mining locomotive in the English section, is shown by Sweden. This is a tank machine and built to run in the mountains on a narrow gauge track. It is evidently a well constructed machine, and capable of doing good service, but of course will not come up in neatness of construction or compactness of build with a similar class of engines turned out by the Baldwin locomotive works. A large upright engine (Wolf's pattern) is also shown, also a horizontal engine of quite a different pattern, both well built and showing good work. A new and novel governor cut-off is shown, working by a cylindrical expansive valve, which appears to be a most excellent and effective device.

The Swedish exhibit which of all others from that country is the most attractive to the general public, is a full set of instruments—12 in number—designed to illustrate the "Swedish movement cure." It is exhibited by Dr. G. Zander, a native, who exhibits each piece of machinery in practical operation at certain hours of each day, submitting either his own person and limbs or those of any of the visitors who may be willing to try the virtues of the "movement cure."

Sweden also exhibits in agricultural hall, but her chief exhibition is in the main building, both of which will be noticed in due time. When it is recollected that this little country is not larger than California, and has no greater population than the State of New York, it is a matter of much gratification to American visitors that she has taken so great an interest in our Centennial exposition. Mr. C. Jablin, who is chief commissioner for Sweden, states that this exhibition greatly exceeds any previous similar efforts of that country at world's fairs. It may not be generally known that a large colony from Sweden, consisting of about 1,000 in number, landed at the mouth of the Delaware river as early as 1638, and there founded "New Sweden." Many of the present citizens of Wilmington, Philadelphia, and other places in this vicinity are proud to trace their ancestry back to this settlement, and some of them keep

their peculiar church organizations to the present day.

The Spanish Exhibit

Is scarcely presentable as yet. The chief effort of this country has been made in other departments than that of machinery. The principal article thus far visible in machinery hall is what appears to be a small chain excavator, with an engine to drive it. Another small engine is also shown, and a sewing machine, much after the style of the American machines, and handsomely mounted on a somewhat imposing pedestal. There is also a model of a railroad track of peculiar construction, the particular application of which is not apparent and cannot be made so to the uninitiated in the absence of any attendant.

Although the Spanish exhibit in this hall is quite meager and very limited in extent in comparison with the more pretentious exhibits around them, we cannot but admire the courage of the three or four individuals who are here. They appear in no way set back by the disparity, and work on with as much nonchalance as though there were scores of their countrymen present. A most excellent spirit in this direction prevails everywhere. While each is doing his or her best to make the most of what they have, either as individuals or nationalities, every one seems cordial toward all around, and each seems to be striving to make the most of the exhibition as a united whole. The visitors also seem to be animated with the same spirit, and a complimentary remark is often dropped within the hearing of a minor exhibitor, which is evidently intended more as a word of cheer and comfort than for the real expression of an opinion in regard to any particular excellency or superiority of exhibits. It is gratifying to this witness and record such evidences of genuine politeness on the part of a people not over particular in such regards when acting as entertainers of those who are proverbial for such delicate attentions. It is such little things that will really accomplish the earnest results in making this great social and industrial reunion of the nations one of unalloyed pleasure and profit to all. It is by such means that whatever of rivalry may and should appear shall be so toned that even the defeated shall enjoy the successful competition of a neighbor almost equally with his own, consoling himself that what he has lost in point of honor will be more than made up by the ideas which he has gained in regard to a new departure, which he hopes will lead him to a sure victory in the next contest.

Spain's best efforts at this exposition seem to have been directed to the art gallery, to her general exhibit in the main building and in agricultural hall, where we shall find her in some future letter, holding a most honorable position among the leading nations of the world.

The Empire of Brazil.

The presence of the distinguished head of this government, and the interest which he has manifested in everything connected with the exhibition and with the resources of our country at large, attracts unusual interest to the Brazilian exhibit. Her display in the three principal buildings is all very superior, both in merit and in the manner and taste displayed in arranging the same. The two great nations—Brazil and the United States—occupy a very large portion of the American continent, and contain about one-half of its population. And, notwithstanding their dissimilarity in government and language, they are in many respects very similar, and in sympathy drawn very closely together. The commercial relations between the two countries are very important, and their diplomatic relations have ever been of the most friendly character. The interchange of products between the two countries is growing more and more important every year, and from conversation with her representative in charge at the exposition—Luis de Rezende—I learn that the people and government of that country are exceedingly anxious to still more encourage and foster this condition of things. It is to that end that this fine display has been prepared, which will enable our people to learn much about that country that they have never known before, and which they cannot gather from books. Let them go into the various buildings and see what Brazil is presenting for the world's gratification and for our mutual profit. Those who visit the exposition for study will find much to learn there. Our government and people have given Dom Pedro II a most cordial welcome as the great and enlightened ruler of a vast and productive country, which furnishes a rare instance of wise and progressive imperialism. They have also learned from the personal appearance of the Emperor how little of the common trappings of royalty hedge about an emperor when both ruler and people are enlightened and infused with modern progressive ideas.

Referring to the exhibit in machinery hall, we find a vertical twin steam engine, built at Rio Janeiro, and models of several other engines, evidently intended for river boats on the Amazon and the other great rivers of the empire, together with many other products of the shops of that country, which attest the skill to which her mechanics have arrived in the difficult art of forging, founding and working iron, steel and bronze. Two large eight-inch breech loading bronze siege mortars, elegantly finished, and two bronze ship's guns, one with a wooden and the other with an iron carriage, are exhibited, to which are attached all the modern appliances for working the same; also several pieces of field artillery of steel and bronze, rifled and breech loaders—all the works of native artisans—display much skill in the art of

cannon founding. A mountain four-pound howitzer of peculiar construction and mounted upon two horses—life size models—with a still more peculiar harness equipment, intended for mountain warfare, show that this people are earnestly studying the art of war—for protection at least. This mountain howitzer equipment is quite novel, and appears to be perfectly practical and simple in all its details. It is capable of great celerity of movement and most effective execution with properly trained horses. Perhaps our own government might learn something to its advantage from this exhibit in its contests with the Indians of our own mountain fastnesses. A miniature fort, with its armament and military surroundings, taken in connection with the more formidable displays already noticed, is eminently suggestive of the progress which Brazil is making towards an important position among the great nations of the earth.

But her most interesting and creditable display is in the arts of peace. A neat little pavilion, attractive with gay trappings of silk and woolen, is constantly filled with an admiring crowd of ladies and their escorts to witness an exhibit of the silk interest of that country, particularly in its productive department. The progress of the work is shown up to the production of the raw material, which is wound off from the cocoons with deft and fairy fingers, supplemented with very simple but effective machinery, the invention of Luis de Rezende, the gentleman already mentioned as in charge of the Brazilian exhibit, who is largely engaged in producing silk. This exhibit, together with the extensive ones in the main building and in agricultural hall, are highly creditable, and give unmistakable evidence of the rapid advance which this empire is making towards an important position among the leading industrial nations of the earth. As a further evidence of progress in this direction, we may allude to the fact that Brazil is fast binding together the distant parts of her vast empire by means of railroads across her great plains, and lines of steamboats along her magnificent rivers and throughout the immense extent of her sea coast. One of the finest locomotives on exhibition bears this description—"Estrada de Ferro de Dom Pedro." It is numbered "89," and was built at the Baldwin locomotive works, near this city, the Brazilians not having yet essayed the difficult mechanical branch of locomotive building. Mr. Williams, one of the proprietors of the works named, informed me that the figures 89 represented the total number of locomotives which his company had built for only one of the dozen or more different railroads now in operation in that country, that one, however, the most extensive of all.

Russia.

Owing to diplomatic difficulties Russia was the last European country that accepted the invitation to participate in our Centennial; consequently her preparations were made somewhat hastily. Moreover her goods were unfortunately sent on a ship which had to put back by reason of stress of weather. But for these circumstances she would have been all ready with her exhibits at the start. Her people manifest much energy, are good workers, and appear to enter with hearty zest into this great industrial contest. She has uncovered a number of locomotive tires, the special character of which is not apparent, unless it consists in their very great diameter—fully six feet or more. There is still in this department a large number of unopened boxes, whose contents are unknown to the writer, but which in due time will, no doubt, make a most interesting and creditable exhibition. We may take occasion to refer to them further when we come again to Russia in the main and agricultural buildings.

No other European nations except England, to which my next letter will be especially devoted, are making any noticeable exhibits in machinery hall.

W. B. E.

CARE OF LOOKING-GLASSES, ETC.—A correspondent of the *New England Farmer* says: "Perhaps some readers have wondered why looking-glasses sometimes get so dull and dim that no washing or rubbing will make them clear. That dimness is caused by heat. A looking-glass or mirror subjected to sunshine several hours every day, or to the hot air from a furnace, register, or stove, or to the heat of a gas light or kerosene lamp, will soon become ruined. At first some portion of the glass looks dim and misty, then more cloudy, and finally, spotted or speckled with black; for the heat has caused the coating of quicksilver to expand and loosen its hold upon the back of the glass, till, after a time, particles fall entirely away, and the glass, once beautiful by fair reflections, is rendered unsightly and unattractive forever. Oil paintings are often seriously injured by the same cause. Much of the blame laid upon the careless mixing of the colors—especially those used by modern artists—rightly belongs to those who hang the pictures. Care is taken to place them 'in good light,' still greater pains should be taken to secure them from heat. If, during some portion of the day, the sun shines directly upon these paintings, or heat rises constantly toward them from stove or furnace, the canvas gradually takes on a dull appearance and soon presents an array of cracks that fills us with dismay."

ALBUMEN.—No albumen manufactured is equal to that obtained from an egg, hence the incredible number of eggs consumed in the manufacture of calicoes. One of the large calico manufacturers in France is said to consume the product of 300,000 hens.

MECHANICAL PROGRESS.

Great Guns.

One round with the 81-ton gun, says *Iron*, was fired on Wednesday at the butts in Plumstead marshes. The charge consisted of 260 pounds of powder, and the result showed an increase of velocity in the projectile, with a diminution of pressure in the gun as compared with previous trials. This is the first time the gun has been fired with the enlarged powder chamber, and so far as can be judged at present, it appears that the alteration which has been made is conducive to the power of the gun. Sir Joseph Whitworth's new steel gun, with hexagonal bore, has come to grief. The experiments were made at the French Government butts at Gavre, and their main object was to show that, with a heavier projectile than that used with the Woolwich 35-ton wrought iron gun a higher velocity, and as a consequence a greater penetrative power, could be obtained by the new weapon. The projectile used on the occasion was about four times the length of its diameter, which, as the bore of the gun in its maximum caliber is 12 inches, would give it a measurement of about four feet. It was a shell, unfilled, and weighed no less than 1,250 pounds, or 50 pounds more than the bolt fired by the Woolwich infant, a gun of the same weight. The mild powders which are found to produce such satisfactory results with the wrought iron guns were first tried, but the velocities attained were disappointing, and the old description of powders, which are more violent in their action, were then resorted to. The velocity, however, was registered at 329 meters only, or about 1,080 feet per second, and ultimately the gun broke down under the enormous strain. The inner steel tube cracked for about three feet near the muzzle, and the metal of the powder chamber was found to have expanded to the extent of one-twelfth of an inch. One or more of the shells broke up in the gun.

A SUCCESSFUL SMOKE CONSUMER.—The *Pittsburg Chronicle* says: There has recently been introduced in Zag's Sable iron mills a smoke-consuming apparatus which certainly accomplishes all that can be desired. It would be hard to conceive anything more simple in its construction or operation. A one-half inch steam pipe runs along the forward wall of the furnace, some 20 inches above the grate bars. From this transverse pipe project inwardly a number of short pipes, terminating in a small orifice. Each of these is surrounded by a "sleeve" of larger pipe, one and one-quarter inches in diameter. The annular space between the interior of the larger and the exterior of the smaller pipes communicate with a flue opening with the outer air the side of the furnace. When a pressure of 20 pounds per square inch has been attained, steam is turned into the smaller pipe. Its escape from the orifice acts upon the air-filled annular space, much as the steam in the Giffard injector does upon the feed water, and, drawing it rapidly through the pipe, projects air and steam into the furnace. The heat of the fire decomposes the steam, and at the same time the carbon-laden smoke is utterly consumed and converted into a bright clear flame that lights up the interior of the furnace. This operation is observable through a mica door in the rear of the furnace. Fixing the eye on the top of the smoke stack, and noting the moment when the steam is turned into the consumer, the inky torrent of smoke is first seen rolling skyward. With the hiss of the escaping steam these clouds are dissipated, like the fog before the sun, and in a few seconds only a faintly depicted vapor is wreathing upward from the stack. The engineer states that the decrease in consumption of fuel amounts to 20 per cent. since the introduction of the consumer. The boilers are of the Wigand pattern. Clearly the days of the "Smoky City," as such, are numbered.

GOOD JOINTS.—Professor Rankin sums up the principles which should be adhered to in designing joints and fastenings in carpentry, concisely as follows: First, to cut the joints and arrange the fastenings so as to weaken the pieces of timber they connect as little as possible. Second, to place each abutting surface in joint as nearly as possible perpendicular to the pressure which it has to transmit. Third, to proportion the area of each surface to the pressure which it has to bear, so that the timber may be safe against injury under the heaviest load that occurs in practice; and to form and fit every pair of such surfaces accurately, in order to distribute the stress uniformly. Fourth, to proportion the fastenings so that they may be of equal strength with the pieces which they connect. Fifth, to place the fastenings in each piece of timber so that there shall be sufficient resistance to the giving way of the joint by the fastenings shearing or crushing their way through the timber.

PRODUCTION OF PIG IRON IN 1875.—The *Bulletin* of the Iron and Steel Institute gives the latest available statistics concerning the production of pig iron in this country: The production of pig iron in 1875 was 2,666,581 net tons, against 2,689,413 tons in 1874, 2,868,278 tons in 1873, and 2,854,558 tons in 1872. The decrease in 1875, as compared with 1874, was 422,832 tons, or more than 15 per cent. The following States, however, increased their production in 1875 over 1874: Maine, Virginia, Geor-

gia, Indiana, Illinois and Wisconsin. The decrease was all in anthracite and charcoal pig iron, respectively 294,098 and 165,567 tons; while there was an increase in the production of bituminous coal and coke pig iron of 36,833 tons; the net decrease being as stated, 422,832 tons. The number of completed furnace stocks at the close of 1875, not including abandoned stacks, was 713, against 693 at the close of 1874, 657 at the close of 1873, and 612 at the close of 1872. The number of stacks added to the productive capacity of the country in 1875 was, therefore, 20, against 36 in 1874 and 45 in 1873. These figures, however, do not represent the whole number of new stacks built in these years, as some furnaces were abandoned in each year. The exact number of new furnaces completed in 1875 was 24, against 38 in 1874, 50 in 1873, and 41 in 1872. Of 713 completed stacks at the close of 1875, 293 were in blast and 420 were out of blast.

A MECHANICAL SCISSORS MAKER.—The *Sheffield Telegraph* says that, "Mr. Henry Walker, manager, 72 Napier street, Sheffield, has obtained provisional protection for an invention which will excite considerable interest in the scissors trade. He has discovered a means of entirely dispensing with skilled labor in the production of scissors blades. At present, as our readers are aware, the process of forging is one requiring considerable skill and time. Mr. Walker, by an adoption of existing machinery, completes the operation of making scissors blades from the sheet of steel, by the aid of a boy or girl. The blank is 'fired,' the hoot cut, and the blade shaped, without the intervention of a skilled hand, at twenty times the speed at which they are at present produced by hand forging. Samples of machine-made blades have been supplied to leading scissors manufacturers, who have found them to answer admirably. Mr. Walker is at present in treaty with the scissors manufacturers' association, to whom the discovery must at present be exceptionally important, seeing that the scissors forgers are on strike."

FINE WORK.—The *Scranton Republican* says: One of the most ingenious pieces of mechanism we have seen in some time has just been completed by two Scranton mechanics, W. Y. Thomas and George Pettigrew, at their home in this city. It is a model coal mine and breaker in miniature, showing, on a small scale, but with an accuracy really marvelous, the *modus operandi* of mining coal and putting it through the several processes which it undergoes in preparing it for market. The entire machine is actuated by steam, setting miners, mules, breaker machinery, cracker-boys and cracker-boxes to work, and reproducing in a wonderfully realistic manner and at a glance, the busy scenes witnessed at any of our coal mines in full operation. The machine stands nine feet high to the top of the breaker tower, five feet six inches wide across the chutes, six feet six inches wide across the mine, and fourteen feet long.

SCIENTIFIC PROGRESS.

Another New Explosive—Herakline.

The *London Mining Journal* says that another new explosive—herakline, which is an improved quality of diorrexine, a blasting powder in considerable favor among the miners of Austro-Hungary—is being brought forward; and as very gratifying certificates of its efficiency and cheapness have been given by prominent French mining engineers, it is probable that the material will meet with a favorable reception in this country. The patent by which the invention is secured are not yet sufficiently advanced to permit of the details of constituents of the powder and process of manufacture being published, but an early opportunity will be taken to make all these particulars known. In the meantime it may be stated that in its present form, although it is so safe that in Austro-Hungary its manufacture and transport by railway is permitted almost without restriction, it is claimed to possess considerable advantages over the powders ordinarily used, especially when applied in hard and compact rocks. The weight of herakline is at least 30 per cent. less than that of ordinary gunpowder, yet the same volume produces a more powerful effect; whilst the price, in Austria, being at least 15 per cent. lower than that of ordinary blasting-powder, it follows that a saving of 45 per cent. is effected by its adoption.

The composition of herakline is stated to be such that its explosion cannot be effected either by heavy blows or by friction of any kind; indeed, it will not explode until brought into contact with a blaze of fire, and then only when deposited in a hermetically closed space. No particular manipulation is necessary in employing it. This explosive is generally used in the form of meal or flour—granulated or not. The loading of a mine with herakline is effected precisely in the same way as the loading with ordinary gunpowder; but it is requisite to ram the charge tightly into the boring-hole. The explosion is then easily and easily effected, either by electricity or with an ordinary fuse. The process of charging, or even the withdrawal of the charge in case of misfire, is said to be positively free from danger; and considering the relative safety of herakline and dyn-

amite, it is remarked that in order to appreciate the advantages accruing from the use of herakline in comparison with the employment of dynamite, the vast importance of the entire innocuousness of the former must, above all, be fully considered. Moreover, a very great difference in the cost price of these two explosives is well worthy of being taken into account. Dynamite No. 1, hitherto highly approved of for all blasting purposes in large mines and quarries (composed of granite or other hard stone), is at least three times dearer than herakline.

Germination of Seed in Cold.

It is a general belief that plant seeds do not germinate at a temperature lower than 40 degs., but late experiments made by Uloth, and published in the *Flora*, a German botanical magazine, show this notion to be erroneous. Dr. Uloth experimented on the seeds of the maple, (*Acer platanoides*), and of *Triticum*, which germinated at 32 degs. In the winters of 1871-2, and of 1872-3, he experimented as follows: he took two boxes and in each had a certain depth of water frozen into a block of ice. In these blocks he made furrows four millimeters (.004 of a meter 39.371 of an inch in English measure) deep, in which he sowed seeds of various plants which were the same for two boxes. He then covered the boxes with a plate of ice, and put them away in two ice houses. He then partly filled two boxes with soil, in which he sowed the same kinds of seeds. These boxes he also covered with plates of ice, and put them in the same ice houses with the others. Care was taken to have a good thickness of ice (over four feet), surrounding the boxes on all sides, so as to provide against any elevation of temperature. The boxes were placed in the ice-houses in January, 1872, at a temperature of 40 degs., and they were taken out on May 15th. In 1873 they were placed in the ice-houses in February, the temperature being 37 degs., were examined on March 25th, and removed on May 15th. The kinds of seed sown were 25 in number. On March 25th, four had germinated, viz: *Lipidium ruderalis*, *L. sativum*, *Sinapis alba*, and *Brassica napus*, all cruciferae. On May 15th, besides the foregoing, the following seeds had germinated: *Arabis alpina*, *Elthionema saxatile*, *Brassica nigra*, *Petroselinum sativum*, *Cannabis sativa*, *Ervum lens*, *Pisum sativum*, *Avena sativa*, *Secale cereale*, *Hordeum vulgare*, *Triticum vulgare*. Hence, the seeds of cruciferae and of gramineae fully germinated at the temperature of 32 degs. Of the seeds named about an equal number vegetated in the ice and in the earth. The radicles had penetrated the blocks of ice. The seed which had not germinated lay rotten on the surface of the ice or of the soil.

THE MILLEPORA A TRUE CORAL.—The animal of the coral, millepora, was by the late Professor Agassiz regarded as a hydroid polyp, or jelly-fish, rather than a true coral polyp. Now, however, it has been shown by Mr. Mosely, of the *Challenger* expedition, who studied the millepora at Bermuda, that the animal is a true polyp. He says that the examination of the millepora is beset with serious difficulties; but he observed that there are large and small polyps, that both kinds have tentacles and appear to be four in number and to be compound. Before this, however, Gen. Nelson, of Bermuda, had made drawings of the animal of millepora, upon which the following comments have been made by Prof. Duncen, of London, in *Nature*: "It is a satisfaction for me to be able to state that Gen. Nelson's drawings prove that Agassiz saw a part of the polyp, and that Mr. Mosely's beautiful delineations, far in advance of all, testify to the correctness of my fellow-worker. I do not credit the hydroid nature of the polyp now, any more than I did when writing the reports on the British fossil corals, and I believe millepora to be an actinozoan."

THE MICROSCOPE AS A CHEMICAL TOOL.—How useful the microscope may be to investigate the composition of solutions of metallic salts, may be illustrated by the following easily-produced exhibition of crystal formation. Upon a slip of glass place a drop of liquid chloride of gold or nitrate of silver, with a particle of zinc in the gold and copper in the silver; a growth of exquisite gold or silver feras will spring up under the eye. It is also interesting to watch under the microscope the evaporation of a drop of any salt solution, especially with polarized light, when the play of various colors, continually changing with the increasing thickness of the delicate crystals, is not only delightful but instructive. Further, it is instructive as well as interesting to watch the action when a drop of the solution to be investigated is placed under the microscope next to a drop of the reagent, and brought in contact while watching the results.

SCIENCE UTILIZED IN COURT.—Science was successfully brought to bear in a forgery suit in court ten days ago in New York, where the testimony of experts and other witnesses failed. It was in the progress of a suit for the recovery of the amount of a check for some \$63,000, purporting to have been certified by a bank teller, but the certification of which was claimed to have been a forgery. The magic lantern and spectroscopic settled the matter. A photographic artist, having darkened the court-room for the purpose, produced on the wall a large picture of the certified check, and pronounced it to be genuine on comparing it with similar certificates acknowledged to be in the handwriting of the teller.

USEFUL INFORMATION.

A Cheap Refrigerator.

It is thus described in the *Country Gentleman*: "It is about the size of and resembles, on the outside, an ordinary tool chest; within there are pieces of wood fastened on for supports, and a lining of zinc put in, the space between the zinc and the wood being filled with pounded charcoal. This filling must be all around, in the cover as well as in the bottom and sides. In the ends of the box, cleats of zinc are soldered on, and the shelves of perforated zinc, or wire, or of wooden slats are slipped in. For a rack to put the ice on, take four slats about four inches long and nail them firmly to a little block or plank; set this block down (like an inverted kitchen table) in a basin, and put it in the middle space in the box, between the rows of shelves. To make a piece of ice do the greatest amount of service and last the longest possible time, wrap it closely in several thicknesses of flannel and lay it on the rack. A square tank holding a pail or two of water can be made of tin or zinc and fitted close up to the inside, with a pipe leading through the box, near the bottom, and a faucet attached. If this is kept filled with cold spring or well water, and a lump of ice thrown in occasionally, it will be found a desirable convenience in hot weather. After the box is finished it should be painted and set where the cover, when lifted up, can rest back upon a brace or frame, as it is heavy and would easily break from the hinges. A cellar is a good place for the ice box, but it may be kept in the pantry, store-room or wood-shed, as is most convenient."

We may add that, if kept in a cool cellar, a rough wooden chest, without the zinc lining and the charcoal, will make a very tolerable refrigerator, if the ice is well wrapped in flannel as suggested above.

MOths IN CARPETS.—Moths will work in carpets in rooms that are kept warm in winter as well as in summer. A sure method of removing the pests is to pour strong alum water on the floor to the distance of half a yard around the edges before laying the carpets. Then once or twice during the season sprinkle dry salt over the carpet before sweeping. Insects do not like salt, and sufficient adheres to the carpet to prevent them alighting upon it.

An Antwerp chemist has lately discovered that the vapor of chloroform will extinguish the flames of petroleum vapor very speedily, and destroy its explosive and combustible proportions, if mixed with it.

GOOD HEALTH.

CURE FOR POISON IVY.—A correspondent of the *Chronicle* writes: I wish to inform your readers of a dead sure cure for ivy poison, that is, those of your readers who attend ponies on week days, not the Sabbath-breakers, for them there cannot be too much ivy; I have carried it with me everywhere where I have ascertained there was the least danger. What is more common than lime? Take a piece as large as a walnut, unslaked; dissolve it in a seucer in a small quantity of water; wash the hands in it; apply to the parts affected; in fact, wash the face and neck, etc.—some of 'em know what etc. means before this—and I tell you there will be no inconvenience from that dose of ivy. I am very sensitive to the poison, so much so that if the wind should blow the dust from the ivy upon my person I am gone; but the lime always straightens me out. I hope you will find it convenient to give this a place in your columns—so simple a remedy and one that will afford immediate relief to those affected.

HOW TO CHECK COUGHS.—Dr. Brown-Séquard, in his late Boston lectures, says that there are many facts which show that morbid phenomena of respiration can always be stopped by the influence of arrest. Coughing, for instance, can be stopped by pressing on the nerves of the lip in the neighborhood of the nose. A pressure there may prevent a cough when it is beginning. Sneezing may be stopped by the same mechanism. Pressing in the neighborhood of the ear, right in front of the ear, may stop coughing. It is also preventive of hicough, but much less so than of sneezing or coughing. Pressing very hard on the top of the mouth inside is also a means of stopping coughing. And he adds that the will has immense power there. There was a French nurse who used to say, "The first patient who coughs here will be deprived of his food to-day." It was exceedingly rare that a patient coughed then.—*Baltimore Physician and Surgeon*.

SMALL-POX SPREAD BY DOGS.—A rural sanitary organization in England has applied through Dr. Mackintosh (*British Medical Journal*), for an order from the magistrate to have all dogs in the district of Boleover chained until small pox has disappeared in that locality. Dr. Mackintosh considers, and very properly, we think, "that the disease is spread from house to house more by domestic animals than by anything else." We believe that the more this subject is examined from this point of view the more the views advanced will be considered correct. It is possible also that the spread of other contagious diseases, such, for instance, as scarlet fever, may be explained in this way when all other recognized reasons have failed.—*Medical Record*.

Table of Highest and Lowest Sales in
S. F. Stock Exchange.

Name of Company.	1 Wk to June 1.	1 Wk to June 8.	1 Wk to June 15.	1 Wk to June 22.
Adams Hill.	250	300	300	300
Advance.	10	10	10	10
Alpha.	50	50	50	50
Alma.	10	10	10	10
Amer. Flag.	10	10	10	10
Amer. Flst.	10	10	10	10
Andes.	10	10	10	10
App.	10	10	10	10
Amazon.	10	10	10	10
Belt'm Con.	10	10	10	10
Belcher.	10	10	10	10
Belmont.	10	10	10	10
Best & Bel.	10	10	10	10
Buckeye.	10	10	10	10
Bullion.	10	10	10	10
California.	10	10	10	10
Challenger.	10	10	10	10
Chollar.	10	10	10	10
Confidence.	10	10	10	10
C. Imperial.	10	10	10	10
Con Virginia.	10	10	10	10
Crown Point.	10	10	10	10
Coso Con.	10	10	10	10
Daney.	10	10	10	10
Dayton.	10	10	10	10
Empire.	10	10	10	10
Empire (Id).	10	10	10	10
Eureka (G V).	10	10	10	10
Excelsior Con.	10	10	10	10
Excelsior.	10	10	10	10
Europe.	10	10	10	10
Globe.	10	10	10	10
Globe Con.	10	10	10	10
Golden Star.	10	10	10	10
Gould & C.	10	10	10	10
Hele & Nor.	10	10	10	10
Ida.	10	10	10	10
Jefferson.	10	10	10	10
Julia.	10	10	10	10
Justice.	10	10	10	10
K. K. Con.	10	10	10	10
Kentuck.	10	10	10	10
Kaickerbkr.	10	10	10	10
Kossuth.	10	10	10	10
Lady Bryan.	10	10	10	10
Lady Wash.	10	10	10	10
Leo.	10	10	10	10
Leopard.	10	10	10	10
Leviathan.	10	10	10	10
Mehogany.	10	10	10	10
Mansfield.	10	10	10	10
Meadow Vly.	10	10	10	10
Mexican.	10	10	10	10
Midco.	10	10	10	10
Mint.	10	10	10	10
Monitor.	10	10	10	10
Newark.	10	10	10	10
New York.	10	10	10	10
Niagara.	10	10	10	10
Northern Belle.	10	10	10	10
New Coso.	10	10	10	10
Occidental.	10	10	10	10
Or. Gold Hill.	10	10	10	10
Overman.	10	10	10	10
Pacific.	10	10	10	10
Pail Sherd.	10	10	10	10
Pioneer.	10	10	10	10
Portman.	10	10	10	10
Prospect.	10	10	10	10
Princeton.	10	10	10	10
Ray & Ely.	10	10	10	10
Rock Island.	10	10	10	10
Rye Patch.	10	10	10	10
Sage.	10	10	10	10
Seg Belcher.	10	10	10	10
Sierra Nevada.	10	10	10	10
Silver Hill.	10	10	10	10
Succor.	10	10	10	10
Union Con.	10	10	10	10
Utah.	10	10	10	10
Wells Fargo.	10	10	10	10
Woodville.	10	10	10	10
Yel'w Jacket.	10	10	10	10

Sales at S. F. Stock Exchange.

FRIDAY, A. M., JUNE 16.	125 Chollar.	30000
255 Alpha.	32.50	100
200 Andes.	2.00	100
40 Bullion.	1.00	100
130 Best & Bel.	1.00	100
30 Belcher.	1.00	100
50 Baltimore Con.	1.00	100
350 Con Imperial.	1.00	100
100 California.	1.00	100
200 C. Point.	1.00	100
10 Chollar.	1.00	100
20 Dayton.	1.00	100
20 Excelsior.	1.00	100
20 G. & C.	1.00	100
20 Globe.	1.00	100
20 Hale & Nor.	1.00	100
20 Idaho.	1.00	100
20 Justice.	1.00	100
20 K. K. Con.	1.00	100
20 Kentuck.	1.00	100
20 Kossuth.	1.00	100
20 Lady Bryan.	1.00	100
20 Lady Wash.	1.00	100
20 Leo.	1.00	100
20 Leopard.	1.00	100
20 Leviathan.	1.00	100
20 Mehozany.	1.00	100
20 Mansfield.	1.00	100
20 Meadow Vly.	1.00	100
20 Mexican.	1.00	100
20 Midco.	1.00	100
20 Mint.	1.00	100
20 Monitor.	1.00	100
20 Newark.	1.00	100
20 New York.	1.00	100
20 Niagara.	1.00	100
20 Northern Belle.	1.00	100
20 New Coso.	1.00	100
20 Occidental.	1.00	100
20 Or. Gold Hill.	1.00	100
20 Overman.	1.00	100
20 Pacific.	1.00	100
20 Pail Sherd.	1.00	100
20 Pioneer.	1.00	100
20 Portman.	1.00	100
20 Prospect.	1.00	100
20 Princeton.	1.00	100
20 Ray & Ely.	1.00	100
20 Rock Island.	1.00	100
20 Rye Patch.	1.00	100
20 Sage.	1.00	100
20 Seg Belcher.	1.00	100
20 Sierra Nevada.	1.00	100
20 Silver Hill.	1.00	100
20 Succor.	1.00	100
20 Union Con.	1.00	100
20 Utah.	1.00	100
20 Wells Fargo.	1.00	100
20 Woodville.	1.00	100
20 Yel'w Jacket.	1.00	100

365 California.	70.00	100
1350 Con Virginia.	50.00	100
1750 Con Imperial.	10.00	100
40 Confidence.	1.00	100
320 Eureka Con.	1.00	100
40 Gould & C.	1.00	100
130 Hele & Nor.	1.00	100
320 Golden Star.	1.00	100
220 Hussey.	1.00	100
15 Justice.	1.00	100
420 Jackson.	1.00	100
385 Leopold.	1.00	100
400 Mansfield.	1.00	100
20 Modco.	1.00	100
230 Mexican.	1.00	100
15 Meadow Valley.	1.00	100
10 Northern Belle.	1.00	100
500 New Coso.	1.00	100
220 Ophir.	1.00	100
475 Panther.	1.00	100
200 Prussian.	1.00	100
10 Raymond & Ely.	1.00	100
100 Sierra Nevada.	1.00	100
220 Savage.	1.00	100
320 Tibo.	1.00	100
50 Utah.	1.00	100
530 Yellow Jacket.	1.00	100
TUESDAY, A. M., JUNE 20.		
735 Alpha.	40.00	100
340 Best & Bel.	1.00	100
15 Bullion.	1.00	100
410 Chollar.	1.00	100
2220 Con Virginia.	1.00	100
600 Caledonia.	1.00	100
2850 Con Imperial.	1.00	100
300 Confidence.	1.00	100
315 Crown Point.	1.00	100
540 Excelsior.	1.00	100
400 Golden Star.	1.00	100
1215 Hale & Nor.	1.00	100
595 Justice.	1.00	100
1100 Julia.	1.00	100
2150 Lady Bryan.	1.00	100
535 Mexican.	1.00	100
1750 Ophir.	1.00	100
220 Ophir.	1.00	100
320 Ophir.	1.00	100
525 Sierra Nevada.	1.00	100
670 Union.	1.00	100
1015 Yellow Jacket.	1.00	100
AFTERNOON SESSION.		
600 Andes.	1.00	100
175 Alps.	1.00	100
310 Alpha.	1.00	100
210 Belmont Con.	1.00	100
35 Belcher.	1.00	100
650 Best & Bel.	1.00	100
200 Bullion.	1.00	100
1320 Con Virginia.	1.00	100
575 California.	1.00	100
450 Caledonia.	1.00	100
100 Chollar.	1.00	100
600 Dayton.	1.00	100
250 Eureka Con.	1.00	100
355 Gen Thomas.	1.00	100
200 Golden Star.	1.00	100
100 Gila.	1.00	100
30 Hussey.	1.00	100
245 Justice.	1.00	100
100 Kaickerbkr.	1.00	100
135 Kossuth.	1.00	100
1315 Leviathan.	1.00	100
610 Lady Wash.	1.00	100
400 Leopard.	1.00	100
100 Morning Star.	1.00	100
100 Mansfield.	1.00	100
575 California.	1.00	100
450 Caledonia.	1.00	100
100 Chollar.	1.00	100
600 Dayton.	1.00	100
250 Eureka Con.	1.00	100
355 Gen Thomas.	1.00	100
200 Golden Star.	1.00	100
100 Gila.	1.00	100
30 Hussey.	1.00	100
245 Justice.	1.00	100
100 Kaickerbkr.	1.00	100
135 Kossuth.	1.00	100
1315 Leviathan.	1.00	100
610 Lady Wash.	1.00	100
400 Leopard.	1.00	100
100 Morning Star.	1.00	100
100 Mansfield.	1.00	100
575 California.	1.00	100
450 Caledonia.	1.00	100
100 Chollar.	1.00	100
600 Dayton.	1.00	100
250 Eureka Con.	1.00	100
355 Gen Thomas.	1.00	100
200 Golden Star.	1.00	100
100 Gila.	1.00	100
30 Hussey.	1.00	100
245 Justice.	1.00	100
100 Kaickerbkr.	1.00	100
135 Kossuth.	1.00	100
1315 Leviathan.	1.00	100
610 Lady Wash.	1.00	100
400 Leopard.	1.00	100
100 Morning Star.	1.00	100
100 Mansfield.	1.00	100
575 California.	1.00	100
450 Caledonia.	1.00	100
100 Chollar.	1.00	100
600 Dayton.	1.00	100
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245 Justice.	1.00	100
100 Kaickerbkr.	1.00	100
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400 Leopard.	1.00	100
100 Morning Star.	1.00	100
100 Mansfield.	1.00	100
575 California.	1.00	100
450 Caledonia.	1.00	100
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355 Gen Thomas.	1.00	100
200 Golden Star.	1.00	100
100 Gila.	1.00	100
30 Hussey.	1.00	100
245 Justice.	1.00	100
100 Kaickerbkr.	1.00	100
135 Kossuth.	1.00	100
1315 Leviathan.	1.00	100
610 Lady Wash.	1.00	100
400 Leopard.	1.00	100
100 Morning Star.	1.00	100
100 Mansfield.	1.00	100
575 California.	1.00	100
450 Caledonia.	1.00	100
100 Chollar.	1.00	100
600 Dayton.	1.00	100
250 Eureka Con.	1.00	100
355 Gen Thomas.	1.00	100
200 Golden Star.	1.00	100
100 Gila.	1.00	100
30 Hussey.	1.00	100
245 Justice.	1.00	100
100 Kaickerbkr.	1.00	100
135 Kossuth.	1.00	100
1315 Leviathan.	1.00	100
610 Lady Wash.	1.00	100
400 Leopard.	1.00	100
100 Morning Star.	1.00	100
100 Mansfield.	1.00	100
575 California.	1.00	100
450 Caledonia.	1.00	100
100 Chollar.	1.00	100
600 Dayton.	1.00	100
250 Eureka Con.	1.00	100
355 Gen Thomas.	1.00	100</

Mining Share Market.

Mining stocks have been extremely dull of late and very much depressed in price. During the latter part of the week a slight improvement has been manifest; still there has been no special activity. Reports from the mines continue favorable and no particular reason is given for the present low market, which has been an unfortunate one for many. Our stock tables show the fluctuation for the week, and also the highest and lowest prices.

The San Francisco Board has resolved to adjourn from Friday, June 30th, till Wednesday, July 5th, at 12 m. No business to be transacted in the street. No definite action has yet been taken by members of the Pacific Exchange regarding the coming national holiday, but it is understood a large number are in favor of adjourning for even a longer period.

Considerable interest is being manifested by holders of Savage stock in the election of officers, which takes place about the middle of July. A large number express themselves as dissatisfied with the past year's management, its large expenditures and onerous assessments. The fear is quite general that the mine may share the same fate that has befallen the Gould & Curry, that is, be need as a drain for adjacent mines. It is said some action will be taken by large holders to secure a more brilliant future.

We give in another column the proceedings of the South Chariot and Newark companies at their recent investigation meetings.

The Overman company will hold a special meeting on July 25th, to take into consideration and decide upon the proposition to increase the capital stock of said company from \$3,840,000, divided into 38,400 shares of the par value of \$100 each, the present capital stock, to \$11,520,000 divided into 115,200 shares of the par value of \$100 each.

The Lady Franklin company also propose to increase the capital stock from \$100,000 in 2,000 shares of \$50 each, to \$10,000,000 in 100,000 shares of \$100 each.

MINING SUMMARY.

The following is mostly condensed from journals published in the interior, in proximity to the mines mentioned.

California.

ALPINE.

ADVANCE MINE.—Superintendent's Letter, June 19: The shaft is down 255 feet; the rock is still hard but more uniform. All the stringers are dipping with the ledge, showing that the ledge is strong enough to support the surrounding rock. The stringers show good ore.

BUTTE.

NEW DRIFT.—Oroville Mercury, June 16: We saw a contract drawn up last Tuesday for the construction of a short distance from town that bids fair to be of some importance to this place. It starts at the West branch, opposite Dogtown, and runs to Dry creek, two miles above Pence's ranch, being a distance of nine and a half miles. It is to carry 3,000 inches of water, and will be completed on or before the 15th of October. E. J. Davis, the owner of the Dry Creek claim, owns the ditch, and Chin Poo is to make it. He begins work immediately with 150 Chinamen. The cost will be about \$30,000. The ditch will then be brought to Davis' claim, near Thompson's flat. But this is an after consideration and may not take place this winter, though all expect it will be done.

GOLD BACKS.—Last Sunday morning, the Spring Valley company's Charokas sent down to San Francisco two golden bricks, valued at \$58,000. It was only a month ago that a similar lot was sent down. Gold enough has been taken out of that claim within the past year to buy all the products of some of the counties in this State.

IN THE FIELD.—Some time ago a number of gentlemen in Oroville, among whom are Hon. P. O. Hundley, Thomas Callow, T. C. Rogers and some four or five others, took up an extensive claim on the North fork of Feather river, and Mr. Callow and Mr. Zambelich left town Wednesday morning with civil engineer Reese, to make the preliminary survey. Just this side of Yankee hill the river makes a huge bend in the shape of a horseshoe. In going a distance of eleven miles, it comes back within three miles of the place where the bend begins. Now, by running a tunnel and ditch one mile, and turning the whole river into Blind canon, some 16 miles of the bed of the river can be rendered perfectly dry. To see if this can be done is the object of the present survey. The company will incorporate and sell stock sufficient to push the work on to completion. They have some able men in the company, upon whose judgment those not so well posted rely with the most implicit confidence.

CALAVERAS.

CLEAN-UP.—Calaveras Chronicle, June 17: Forty-six tons of rock from the Badlock mine at Mosquito was lately crushed in Garland's mill. The quartz paid \$80 per ton. Two shafts have been sunk on the mine, 75 feet deep, and a level driven connecting them. The ledge averages about three feet and a half in width and will all pay for crushing. The mine is undoubtedly a good one, but it is not supplied with machinery for working to advantage.

CONTRA COSTA.

COAL YIELD.—Contra Costa Gazette, June 17: From a well informed correspondent we learn that the April "out put" from the Black Diamond was the smallest in any month during the past four years, being a fraction more than 4,700 tons, and the product in May was 6,186 tons. The combined product of the Pittsburg and Union mines, at Somersville, for the month of May, was a fraction more than 4,569 tons, aggregating for the month, with that of the Black Diamond, 11,755 tons, the market value of which was \$65,000—quite a respectable sum after all, for dull times, though probably less than half as much as is realized when there is a moderately good demand for coal.

EL DORADO.

OLD HOKOYA.—Superintendent's Letter, June 19: Timbering of both shaft and main tunnel has been completed. One thousand tons will be shipped out and kept ready for the mill. The ore breast is looking as good as ever.

INYO.

OSO MINE.—Osos Mining News, June 17: The Defiance mine has opened up some wonderful lodes of ore since last week. The Defiance furnace have been running successfully the past week, making their usual large shipments of bullion.

LEE DISTRICT.—We learn from a very reliable source that the mines in Lee district, belonging to the Emigrant mining company, never looked better than at the present time. In the Cactus mine, at the bottom of the incline, at a depth of 60 feet there is a vein of seven feet of the high grade milling ore for which this mine is noted, the whole being free milling ore, entirely free from feed. The Valentine is looking splendidly. The ore in this vein is supposed at one time to have been entirely given out, but further explorations have demonstrated that a good vein of rich ore exists and is likely to continue to a good depth. The mill is all completed and will start the fore part of next week; and we predict that the most valuable shipment of bullion will be made that was ever sent from a five-stamp mill.

NEVADA.

TUNNEL COMPLETED.—Nevada Transcript, June 17: The Mifflin mining and water company have completed their French Corral tunnel to the upper shaft, a distance of 3,600 feet. This work has been under course of construction since the month of March, 1872. A portion of it was driven by single hand drills and gault powder, but for the past two years the company has been using the Ingersoll drill with great success, making from 80 to over 100 feet per month through very hard rock. Had the air compressors been of the greatest capacity, the progress would have been still more satisfactory to the company, as the power was not sufficient to propel both drills (two being used at the tunnel) at the same time, and the speed of the construction of a work of such a magnitude is the opinion of the manager of this work, that with a compressor with power to raise the air to 60 pounds, (equal to same power of steam), would be ample to drive two four inch cylinder drills to the utmost speed, and driving the drill hole in much less time, thereby facilitating the construction of the work as well as lessening the cost of the same. The completion of the tunnel opens ground on a channel sufficient to last for four years, and a portion of which has been and is being worked by mill process and paying over \$300 per month. The company have an abundance of water to wash the ground, and it is expected the proceeds will be ample to pay for the great expense incurred in running the tunnel and leaving a fat margin besides.

ALLISON RANCH FRANKLIN MINE.—Grass Valley Union, June 13: The new hoisting works of the Allison Ranch Franklin mine were started up on Monday last. The mine was located contemporaneously with the famous Allison Ranch mine, in the year 1853, being its first northern extension of 1,200 feet. It was prospecting to some extent at that time, but no systematic development was undertaken and it remained unworked until the fall of 1875, when the owners determined to thoroughly prospect it. As a preliminary operation 45 loads of rock were taken from the ground, the explorations not extending to a greater depth than 15 feet, and the yield was \$6,000. A result so encouraging determined the owners to open and develop the mine, and in December last they organized and incorporated the company under the above name, a capital stock of 25,200 shares at \$40 per share. The first regular work was done by commencing a large shaft, which is 11 by five and a half feet in the clear, constructed in the very best manner, of the best quality of timber, containing two trackways and an apartment for pump and ladder way. The erection of the hoisting works was commenced about April 25th, and was completed on Monday in order for business. The engine consists of a 40 horse-power pumping engine, and a 30 horse-power hoisting engine; also, double hoisting reels, each five feet in diameter. The main building is 26 by 74 feet in dimensions, two stories 32 feet high, and is to be supplemented by a boiler shed and dry house 20 by 74 feet. The officers of the company are: Edward W. Collins, of San Francisco, President; Martin Ford, Superintendent, and John Ford, Foreman, both of Grass Valley.

PLACER.

RISING SUN.—Placer Argus, June 17: The Rising Sun mining company are meeting with good success. The shaft is down 600 feet in good ore, and the prospect for the future out of all paying rock. The shaft is running steadily, crushing 120 tons of ore per week, running in value from \$20 to \$30 per ton.

GOLD RUN is full of business and improvement. The mine are prosperous and extensive improvements are projected. The Gold Run ditch and mining company, which has run a number of bedrock tunnels in this district, will continue to work their main tunnel the coming fall. The English company cleaned up a few days ago with satisfactory results.

LAKE NOGEE.—Dutch Flat Forum, June 15: Thos. Williams gave us a call last Monday and exhibited a specimen from his claim on Wilmet ravine, weighing 19 ozs. 2 pwt. He and his partner, Frank Eddings, have about 50 acres of ground at an average depth of about 25 feet, all of which prospects well for the standard. They have suspended mining for the season owing to lack of water, but say that plenty of water can be obtained by digging a ditch from Burnett's ravine, four miles distant. Capital could be profitably invested here by constructing a canal having a capacity to furnish sufficient water to work the ground, as they are willing to give one-half for that purpose.

LAKE LANTANA.—The Liberty Hill mine has just finished cleaning up with good results. They set off a blast of 80 kegs of powder on the 9th which did splendid work. They are now refitted and busy washing again. The Raymond claim has turned off to clean up.

LITTLE YAK MINING ITEMS.—The Empire mine is progressing rapidly since their last blast; the gravel is being washed out, and the shaft is being cleaned up. The claim is about to turn off to clean up. They expect good results. The Christmas Hill mine is working through their new tunnel to good advantage.

SANTA CLARA.

SOUTH ALMADEN QUICKSILVER MINE.—San Jose Mercury, June 20: Our reporter paid a visit to the South Almaden quicksilver mine yesterday. This property, which the owners consider very valuable, and the indications certainly bear them out in this opinion—is located on Silver creek, four miles south of Evergreen. On the hills, for a distance of at least a mile, rich croppings have been found, and at the base of the largest a tunnel has been commenced, which, it is expected, will pass a good body of paying rock. The work heretofore has been done mainly in the flat, where the discovery was first made. The rock averaged as well as that taken out at Almaden, and has thus far been put through the furnace in sufficient quantity to pay expenses. In order to raise funds for tunneling the hill and for still further prospecting, 10,000 shares of the stock are offered for sale at \$1 per share.

SONOMA.

LOCAL MINING NEWS.—Russian River Flag, June 16: The Excelsior quicksilver mining company, in the Inyo district, is working two shafts night and day; no ore is being taken out, but they are running a tunnel alongside of the vein to connect with the shaft, for the purpose of ventilation. After the connection is made, the work of taking out ore will commence. The furnace has been repaired and is now ready to begin the reduction of the forthcoming ore. Superintendent Parr has removed his family to the mine, in order that he may the better keep his increasing details under the closest care. The Missouri, in the Pine Flat region, is idle. The Rattlesnake is doing but little. The Oakland, under Superintendent Dennis, is working 50 men, and turning out much quicksilver. The Geyser is prospecting with six or seven men. Their furnace is

at present employed by Wm. Whitton, in reducing surface rock and boulders. It will soon be used by the Kenick to reduce ore which they are now hauling from their mine. The Kenick company are highly elated over present prospects, and are pushing ahead with about a dozen men under Superintendent Hopkins, running an incline to reach the ore bed at a lower point.

TULARE.

MINERAL KING.—Visa's Delta, June 16: Mr. Ford, recorder at Mineral King, and acting superintendent of the New England tunnel and mining company, has just returned from the mines. He reports an unusual amount of snow for this season of the year on all the leading high up from the valley. He thinks it will be as late as the first of July before work can be profitably commenced on these leads. The company, however, have not yet started on the tunnel of the Lower claim. This drift having been run 162 feet fast fall, and the hearings being known, they had little difficulty in gaining access to it beneath the snow.

Nevada.

WASHOE DISTRICT.

CALIFORNIA.—Gold Hill News, June 15: The pumps have been kept working water during the past week, without having exhausted the flow or permitting the resumption of work at the bottom of the main shaft. The water, however, is showing signs of a gradual decrease, so that it will not probably take much longer to get it well under control.

DEARBY.—The frame of the new hoisting works building, 40 by 46 feet in size, and 30 feet in height, is up, ready to be enclosed. The building is being erected large and commodious, in order to have plenty of room for new and large hoisting machinery whenever needed. Sinking the main shaft is making good progress.

BROOKS.—The new and more powerful pumping machinery is expected to arrive some time during the coming week. As soon as it reaches the mine work will be resumed, and it cannot be done before that time, as the flow of water continues too great for the present machinery to contend with successfully.

WARN.—Sinking the shaft is going ahead at the very rapid rate of five feet per day, or 35 to 40 feet per week. It is now down 165 feet, the bottom in good blasting ground. The foundation walls of the new building are being laid and the timbers framed for the boiler house and carpenter and blacksmith shops.

CHOWS POINT.—Daily yield, 150 tons of ore. The east prospecting drift on the 1600-ft level, running east of the ledge, has not yet developed any new or valuable features. The main south drift on the 1700 ft level is steadily advancing toward the Belcher line, but has not shown paying lodes of ore.

PURSEPT.—Since last week's report 19 feet have been added to the depth of the shaft, making it 321 feet deep in all. The Ingersoll drills and machinery operate excellently, and no increase of water interferes with the regular progress of the work.

OVERMAN.—The west drift on the 1250 ft level is rapidly advancing, the face in good blasting ground. The preparation of the pumping machinery for again commencing the sinking of the main shaft is going rapidly forward. Daily yield of ore, 30 tons.

UTAH.—Sinking the main shaft is making much better progress, as most of the water flowing down the shaft has been caught up at the 650-ft station, leaving the bottom comparatively dry. The sinking is being pushed ahead very energetically.

SENRA NEVADA.—Sinking the main shaft is going steadily ahead, the work is good, working ground. Work is progressing well at all points.

SILVER HILL.—Sinking the main incline shaft is going steadily ahead at the rate of two and a half feet per day, the pump still handling the water with the most perfect ease. The east drift on the 440 ft level is steadily advancing.

SUCOON.—Sinking the shaft has been suspended for the present, in order to put in more powerful and efficient pumping machinery.

CRULLA-POTOSI.—Daily yield, 120 tons of ore, the average assay value of which is \$32 per ton. Sinking the main incline is making good progress, also sinking the combination shaft is making favorable headway.

BEST AND BELCHER.—Everything in this mine is quietly awaiting the completion of the new pumping machinery of the Gould & Curry, nothing can be done on the deep levels until that is finished.

CONSOLIDATED VIRGINIA.—Daily yield, 500 tons of ore. The ore breasts show little or no change in any portion of the mine. The extraction of ore was considerably interfered with for two or three days past by some necessary repairs to the 1500-ft station and the main shaft below that point. The new shaft, however, has a pump and the extraction of ore at all points is progressing as usual. The supply of ore at the mills was amply sufficient to keep all going, so that there was no stoppage with that portion of the work. The east drift on the 1500 ft level is making good headway. The drift west from the O. & C. shaft to connect with the east drift on the 1500-ft level is advancing at a rate of about 10 feet per day, and is now at the foot of the mine of Nevada. During the past week it has penetrated a distance of 70 feet, or at the rate of 10 feet per day. The erection of the new 80-stamp crushing mill is going rapidly ahead. The erection of the amalgamating mill is also getting well under way. The foundations are about completed, the framework ready for erection and the machinery is being set all in place, and ready to be placed in position for use. On the 1700-ft level the north drift is advancing as rapidly as the great heat will permit.

CALIFORNIA.—Daily yield, 350 tons of ore, keeping the mills running up to their full working capacity. The ore breasts on the 1600-ft level are opening up splendidly. The cross cuts recently started to the westward are making good headway, and are advancing with constant change of interest. The main north drift, connecting with the Ophir on the 1400-ft level, is being thoroughly retimbered. The east and west cross-cuts now being run on the 1600 ft level are showing the ore body to be as rich, if not richer, than at any other point where it has yet been opened. Sinking the C. & O. shaft is going on without interruption, at the usual rate of speed. A considerable quantity of ore is being extracted through the Ophir shaft, and the yield of the mine will be considerably greater for the month of June than it has been for any one month since the commencement of the extraction of ore.

OPHIR.—Daily yield, 300 tons of ore. The ore breasts both north and south on the 1600-ft level are yielding a good supply of excellent ore, with every prospect of continuing or even increasing the amount for a long time to come. The north drift on the 1600-ft level is steadily advancing toward the Mexican ground. On the 1700-ft level the drifts and cross-cuts have been cleaned out and repaired ready for more active future operations. The north compartment of the 1700-ft level has been completed, and the shaft is now furnished with three fine working compartments, either of which is calculated to do a large amount of hoisting. Both the raising up and sinking of the main incline shaft below the 1300 ft level is making steady and favorable progress. The mine has not for years been in as fine a working condition as at present.

AMAZON.—The west shaft is going rapidly ahead. Three levels have been opened in this mine, the lowest being at a depth of 300 feet. The ledge from the surface down to that depth has been gradually widening and is encased in regular well defined clay walls of the best possible character. On the third level a winze has been sunk to a depth of 20 feet on a strike of quartz and low grade ore. The shaft is being driven out by a flood of water, and the sinking stopped. It is now the intention to sink the main shaft 100 feet deeper and then tap the water and open a new level.

HALE & NORRIS.—No faster or more perfect work of the kind was ever accomplished than is now being done in the erection of the new pumping machinery at

this mine. Everything is steadily advancing toward completion, and it will be but a very short time before all will be in readiness to steam up. The old pumps and bolts are being taken from the shaft, the stations are being enlarged and the new pumps and columns are being lowered into position, ready to connect and put into use as soon as the engines are ready to start up.

YELLOW JACKET.—The north winze on the 1940-ft level is down 89 feet below that level, the bottom in good sinking ground. Cross-cut No. 2 on the 1910-ft level is in a distance of 220 feet, the face in very favorable formation. A drift has been started at a point 50 feet below the 1940-ft level in the east winze, which is now in 25 feet, the face in fair grade ore. On the 1740-ft level the east cross-cut between the north and south winzes is in a distance of 168 feet.

JULIA.—The main south drift on the 1000-ft level is rapidly advancing, the face in very favorable ground. The west drift on that level is also steadily advancing, the face in quartz and low grade ore of a fine and encouraging character. The face of the main south drift on the 1800-ft level is still in quartz and low grade ore of a better character than has before been encountered in that portion of the mine. The west drift on the same level is also showing fine quartz and low grade ore.

BULLION.—The progress of the northeast drift on the 2000-ft level has been greatly impeded during the past week by the breakage of the Imperial pumps. This trouble will, however, be remedied in a day or so more, and the work can then be forced as usual. The upraise from the 1700-ft level, and the winze from the 1400-ft level to meet it, are each making the usual fair rate of progress. Sinking the main incline is going rapidly ahead. The north drift on the 1400-ft level is also making excellent progress.

SAVAGE.—The foundations for the immense pumping engine are finished with the exception of placing the coping stone, which is now being done. The engine arrived yesterday morning and will be placed in position for work in a very few days. It will not now take a very great length of time to complete the whole ready to commence the extraction of water.

BELOCHEN.—Daily yield, 400 tons of ore. There is little change in any of the ore breasts or stops. The erection of the new pumping machinery is going steadily ahead. Nearly all of the machinery is now on the ground, and the foundations for its reception are fast approaching completion. Sinking the air shaft is making good progress. It is now down 50 feet below the 1600 ft level.

GOULD & CURRY.—Preparation for the erection of the new pumping machinery is being advanced as rapidly as the nature of the work will permit. The engine furnishing the steam power to drive the new section mill for the ventilation of the lower levels of the mine are up, and the erection of the other portions of the machinery well advanced.

NORTH CONSOLIDATED VIRGINIA.—Sinking the shaft has been suspended at the depth of 550 feet, pending the putting in of new and powerful pumping machinery. The foundations for the pumping engine and other machinery are being laid. Stations are also being cut in the shaft for the pump bolts and pumps.

IMPERIAL.—In the bottom of the north winze, on the 2000-ft level, during the fore part of the week, a few streaks of porphyry and poor ore was encountered, but yesterday afternoon the bottom was again in ore of the richest character, the average assays running up to \$400 per ton.

COSMOPOLITAN.—The fine circulation of air secured by the completion of the upraise from the main adit tunnel to the surface is of incalculable value in assisting the development of the mine. The distance to the surface, or length of this upraise, following the incline, is 154 feet, the vein in the shaft is steady throughout, and shows good widths of excellent ore at several points. The main drift, following the vein toward the northern boundary, is advancing steadily, with the face in fine grade ore.

JUSTICE.—Daily yield, 120 tons of ore. The ore breasts both above and below the 600-ft level look well, and yield a usual quantity of good milling ore. The main south drift on the 800-ft level is steadily advancing, the face in very favorable ledge material. The north drift on the 1000-ft level also shows better as the drift advances. Sinking the main incline is making good progress.

ROCK ISLAND.—The north drift on the 850-ft level still continues in a very favorable formation. The main west drift on the same level is showing quartz and spots of low grade ore. The main south drift on that level is also in quartz of a highly encouraging description. The main south drift on the 650-ft level is showing some fine quartz and low grade ore.

TWIN PEAKS.—During the past week the drift at the 75-ft level has been driven west a distance of 45 feet, penetrating what is now considered to be the main ore body. The drift is now at a distance of 180 feet from the Constock texture, and carries much more metal than any encountered heretofore in the mine. It runs due southeast and northwest, and shows a strong, permanent vein.

EMERALD.—The 600-ft station has been opened and a drift started to cut and prospect the ore vein on that level.

KOSUTH.—The opening up of the 500-ft level can now soon be commenced in good earnest, as the heavy flow of water recently struck in that portion of the mine is fast becoming drained.

BUTTE TUNNEL.—No increase of water, and work advancing finely in the header, the Ingersoll and Burleigh drills doing splendid execution. Total length of tunnel, 34.45 feet.

TAYLOR.—The new road has been completed to the site of the shaft. Sinking the shaft is going rapidly ahead, the rock in the bottom still blasting out finely.

GLACOW.—The combination shaft of the Amazon & Glasgow mines has attained a depth of 323 feet. The rock in the bottom is quite hard but blasts well.

ANDERSON.—The 800-ft level is being opened, and a pump tank at that point is being put in. Sinking will be resumed in about a week.

UNION CONSOLIDATED.—The prospecting drift north on the 1300-ft level is steadily advancing, the face still in very favorable ground. Otherwise nothing new.

SUPERIOR.—The new spur wheel arrived this morning and will be put in position ready to resume hoisting the water some time to-morrow.

Idaho.

WAGONTOWN MINES.—Idaho Avalanche, June 17: The 35 tons of Webster ore crushed at Leonard's mill only yielded \$22. It was quite a disappointment, as better returns were expected; but the fact that the ore was not assayed caused the disappointment. Even this yield assured us that it is a valuable mine when it can be worked economically.

POORMAN.—The recent developments in this mine have furnished material for encouragement. Samples of the rich rock taken on a few days ago which were assayed averaged \$25,000 to the ton in gold and \$3,000 in silver. This is one of the richest and most prolific developments that the camp has ever furnished.

GOLDEN CHARIOT.—The working force at this mine has been increased recently. The mill is running on first-rate quality ore, about 40 tons of which are daily conveyed from the mine.

MISCELLANEOUS.—There is a general feeling of hope that after the present storm of the court is over no obstacles being in the way towards taking steps looking to the resumption of work in the mines, matters will soon present a brighter outlook, and the mining situation steadily improve. Most of the stock of the Oro Fino is now controlled by men of capital and energy, and in connection with the assistance of recently arrived capitalists there are grounds for the belief that the mine will resume work at an early day.

HERCULES POWDER.



HERCULES Slaying the Giants.

Hercules, the son of Jupiter and Alcmene, was descended directly from the Gods. He performed more wonderful deeds of strength than any of the heroes of old. On one occasion, he was sent by Eurystheus to execute a very great task, when he found himself opposed by several Giants, among whom were the powerful Giant Geryon, Eurystion, a Monster with three heads and six arms, and the two-headed dog, Orthus. All these he slew with his club. He then came to a high mountain, which, with one blow of his club, he broke from summit to base, and thereby made an entrance into the Mediterranean Sea, through the Rock of Gibraltar, the Straits of which are known to this day as the Pillars of Hercules.]

We wish to call the attention of Miners and others to a few points of the superiority of **Hercules Powder** over all other strong Explosives:

1. Its strength is greater than that of any other in use. The materials of which it consists are compounded upon strictly scientific principles, and are not a simple neutral absorbent employed that will hold a quantity of Nitro-glycerine. It is the opinion of the best chemists to whom the matter has been submitted that no mixture has been employed that so thoroughly promotes the whole tremendous force of the explosives employed, and at the same time neutralizes the offensive gases caused by the explosion. With this powder one-half the time is saved that is lost by using any other strong Powder, before you can resume work after a blast.
2. **UNIFORMITY.**—The materials of the mixture are chemically prepared, and therefore, great uniformity can always be depended upon and the best results obtained. This is a great advantage over any that varies in its strength as those must which are mixed with any natural earth.
3. **SAFETY.**—So perfect is this mixture that no accident can happen with it from premature or accidental explosion, if persons will half follow the rules laid down for its use. No Powder has ever been invented where so few accidents have happened with it in proportion to the quantities which have been used.
4. **CARTRIDGES.**—It is well known that nitro-glycerine has a tendency to decompose by volatilization. These are the "fumes" that are smelled on going into a close warm drift, or room where nitro-glycerine powders are stored. To prevent the escape of these "fumes" an almost hermetically sealed cartridge is employed, and so effectually is it, that some cartridges filled with Hercules were exposed to a blazing California sun for six months in summer, with no perceptible loss of strength. This is a great advantage over the open porous paper generally used for cartridges.
5. **ECONOMY.**—We believe that any miner who will take the trouble to investigate the matter will satisfy himself that full 15 per cent. is saved by using the HERCULES over any other strong Powder manufactured.

Query. Is this worth saving? We should think so. Try it. {Hercules X X No. 1, for extreme hard rock.
{Hercules X X No. 2, for medium hard rock.

The GREAT SUCCESS of the HERCULES POWDER naturally aroused a strong opposition to its use, and litigation in defense of its rights become necessary. We would therefore call the attention of the public to the FINAL DECISION in the U. S. Circuit Court of the whole matter in favor of the California Powder Works, *which explains itself*:

DECISION OF THE COURT.

At a stated Term of the Circuit Court of the United States of America of the Ninth Judicial Circuit, within and for the District of California, held at the Court Room thereof, in the City and County of San Francisco, on Wednesday, the sixth day of October, A. D., 1875.

Present—Honorable Stephen J. Field, Associate Justice of the U. S. Supreme Court; Honorable Lorenzo Sawyer, Circuit Judge.

THE GIANT POWDER COMPANY vs. THE CALIFORNIA POWDER WORKS, Et AL., *In Equity, No. 1,237*—The Court having, on the 23d day of September, A. D., 1875, being a day in the July Term, A. D., 1875, of said Court, sustained the demurrer of the defendants to the complainant's amended Bill of Complaint herein, will leave to complainant to amend its said bill on or before the next succeeding rule day, and the said time granted complainant within which to amend its said bill having expired, and the default of said complainant to amend its said bill having been duly entered, and the Court having on the sixth day of October of the said term and year, on motion of C. R. Greathouse, Esq., Solicitor for defendants, M. A. Watson, Esq., Solicitor for complainant, being present, in open Court, and declining to amend his said bill of complaint, he having elected to abide by his said bill of complaint as filed in this cause, ordered that a decree be entered here dismissing said bill.

Thereupon, upon consideration thereof, it is ordered, adjudged and decreed, that the complainant's said bill be, and the same hereby is dismissed, and that the said complainant pay the said defendants their costs in this behalf expended.

October 13th, 1875.

ENDORSED:—Filed and entered, October 18th, 1875.

(Signed)

LORENZO SAWYER,
U. S. Circuit, Judge Ninth Circuit.

L. S. B. SAWYER, Clerk.
By J. F. O'BRIEN, Dep. Clerk.

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MINING SCIENTIFIC PRESS

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DEWEY & CO., Publishers.

A. T. DEWEY, GEO. E. STROMO,
J. B. EWER, JNO. L. BOONE

Office, No. 224 Sansome St., S. E. Corner
of California St., San Francisco.

Subscription and Advertising Rates:

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We wish to thank those subscribers who send in their renewals to the Press promptly as regularly as the year comes round. It saves us much expense in commissions for collections and renewals. May we not request more of our good patrons to do so!

THE ORIGINAL ARTICLES in this paper are mostly set in solid type, giving in one column one-third more reading than is contained in ordinary leaded matter.

Our latest forms go to press on Thursday evening.

San Francisco:

Saturday Morning, June 24, 1876.

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USEFUL INFORMATION.—A Cheap Refrigerator; Mothe in Carpets, 403.

MINING STOCK MARKET.—Sale at the San Francisco, Pacific and California Stock Boards; Notices of Assessments; Meetings and Dividends; Review of the Stock Market for the Week, 404.

MINING SUMMARY.—From various counties in California, Nevada and Idaho, 405.

GENERAL NEWS.—General News Items and Miscellaneous Paragraphs, on 409 and other pages.

NEW ADVERTISEMENTS.

The Allen Engine Governor, Pacific Iron Works, S. F.; The Gardner Automatic Safety Stop Governor, Berry & Place, S. F.; Eleventh Annual Exhibition of the Mechanics' Institute, A. S. Halliday, Pres't, S. F.; Hope Quicksilver Mining Co.—Sale.

OUR INDEX, ETC.—We are unable to give this week as much reading matter as usual, on account of the index for the closing volume, which appears on the last page. This, with the crowded state of our advertising columns, has somewhat disarranged the usual order of things, and some of the advertisements appear on unusual pages. To make up for these deficiencies we propose next week to print a 24 page Centennial issue, with appropriate illustrations, and to publish moreover a very large edition. This, for the beginning of the volume, is an indication of the improvements we mean to make, as we propose to make the Press so valuable to its special class of readers that no one can afford to be without it.

NEW CANNEL COAL MINE.—This mine is situated three miles from Santa Rosa and half a mile from Smith's sulphur springs, Sonoma county. They have now sunk a shaft 40 feet in depth on an incline of 35 degrees, making it 24 feet in depth from the surface. The seam of coal is five feet wide complete, three of which is clean, good coal. They have saved the coal for the last eight feet. The coal husks clear and free, leaving but little white ash and no residue. We have received samples of the coal which appear to be of excellent quality. Our correspondent will soon visit the mine and send us a more detailed description of this new coal discovery.

A LARGE PAPER.—We acknowledge the receipt of the Centennial issue of the *Spirit of the Times*, probably the largest specimen of a newspaper ever published. The number is very profusely illustrated, and comprises 40 pages in all, much of it of a generally local character. The proprietors have shown a spirit of enterprise in keeping with the Centennial year and the name of their paper.

The Committee on Salaries of the Board of Education have recommended a reduction of five per cent. in teachers' salaries in this city.

A Word of Caution.

We occasionally hear complaints from the East of certain credulous persons having "taken in" by purchasing worthless mining stocks, supposing them to be of value. The general lack of knowledge in the Eastern States with regard to mining operations on this coast has led many unscrupulous persons who have been here to pass off on unsuspecting victims worthless mining stock, or persuading them by false representations to organize companies and advance money on worthless ground or ground which oftentimes has neither value nor locality. The latter used to be a favorite dodge, but the lead has been so closely worked that there is not much chance now for pay in it. But with mining stocks it is different. For the last year or two the Eastern papers have been filled with accounts of the bonanza mines and descriptions of bonanza millionaires. The various articles which have appeared on these subjects have caused considerable excitement wherever read. We know here what an excitement "the bonanza" raised among our own people who are used to mining excitements. We understand that the riches are confined to a few mines and that certain others stand a chance of coming in for their share; but nevertheless the people of this coast invested and continue to invest largely in other mines miles away from the bonanza, in hopes of striking it there, too.

If we who are supposed to be posted on these subjects have the stock fever so widely diffused we must not consider those unusually foolish who buy stocks of any kind which come along, with the expectation of making fortunes out of them. In fact, we do the same thing ourselves here. When a new stock comes on the board, it is bought up on general principles without the buyers ever knowing or caring where or what it is as long as they see a chance of profit and can buy at hedrock prices. The Eastern people who see on the certificates, "Capital stock \$5,000, 000 in 50,000 shares of \$100 each," think they are getting the stock cheap when they pay \$10 per share; but we here know that this kind of stock, "par value \$100," is often sold for ten cents per share, when it is "hedrocked" on the market.

We know, moreover, that thousands of shares of stock which have no value whatever are floating about the country. The stock of companies which have failed or temporarily abandoned work, or had the sheriff take possession, or have otherwise "busted," is apparently good. It is not cancelled or destroyed, and when unscrupulous parties have this kind of stock and go to a region where they can put on wise looks and use a few mining terms, they stand a pretty good chance to dispose of it to credulous individuals.

There is scarcely any way to guard against these practices, and the people of the Eastern States have been pretty heavy sufferers from them from time to time. It has worked great injury to the mining interests without doubt, as those who have been "bitten" take good care to warn others, and really meritorious enterprises have been made to suffer. If people in the East desire to engage in the laudable venture of mining enterprises, and would do so intelligently, let them subscribe for and carefully consult the *MINING AND SCIENTIFIC PRESS*, in which every mining enterprise worthy of mention is noticed from time to time. A mining enterprise of the Pacific coast which is not referred to in this journal in some way or another, as often as once in three or four months, is certainly one which people in the Atlantic States should beware of. Moreover, we are willing to furnish such information as is in our power to all our subscribers concerning mining enterprises. Even here we cannot readily guard against "wildcat companies," but we can tell whether any certain company is still in existence and whether its mine is being worked or not. Our Mining Summary contains notices of mines weekly, from all sections of the coast, and we can generally find out something concerning any special mine about which information is desired. This warning is particularly timely just now, when so much interest is manifested by people east of the mountains in the mining resources west of them.

End of Volume XXXII.

Again the march of time has brought us to the end of a volume, this being the last issue of Volume XXXII of the *MINING AND SCIENTIFIC PRESS*. The copious, although condensed, index on the last page of this issue, shows the variety and scope of the contents of the 26 papers which have made up the volume, and speaks more for the value which we give for the price of a year's subscription than we can say in this connection. As a new volume begins with the next issue, we take occasion to suggest that it is a good time to subscribe. While there is every reason for gratification at the circulation which this journal has reached, we are yet well aware that there are numbers of miners, mechanics and lovers of science to whom it might be made a source of much usefulness and profit. We feel no hesitation in urging the claims of the paper upon the attention of all for whose special benefit it is published. Having a circulation among special classes and the most intelligent and thriving portion of our people, it presents a very valuable medium for advertising—a feature which

our columns show for themselves, is quite generally appreciated.

We take occasion also to remind many of our old subscribers and readers that communications of a character suitable to this journal are always acceptable. We are pleased at all times to hear of anything new in mining or mechanics, and will take every care that due credit is given to the writers. Those who are engaged in practical work have so many opportunities for observation that they should impart their increasing knowledge to others. Every branch of trade has its peculiarities and its varying improvements, and those who have an opportunity of observing them should not hesitate to assist others. This paper is a proper channel for such communications, and we desire to encourage correspondents. If any of our readers who have the inclination to write but are only deterred from so doing because they fear that their literary efforts may not equal their mechanical, will send in their articles, we will take pains to arrange them properly for publication.

Again we say this is a good time to subscribe. No miner or mechanic should be without a home paper devoted to their interests. Hints and suggestions of infinite value to all classes of mechanics and miners are constantly being published, and we are careful to glean from all sources whatever will be useful to our subscribers. The *MINING AND SCIENTIFIC PRESS* is read in every mining camp west of the Rocky mountains, and it is the duty as well as the pleasure of its editors and proprietors to make it a welcome weekly visitor. We propose to continue to improve the Press and make it even more valuable and interesting to miners and mechanics than ever.

The Mechanics' Institute Fair.

Active preparations for the eleventh industrial fair, under the auspices of the Mechanics' Institute, continue to be made. The managers are holding frequent meetings for the purpose of perfecting arrangements for the exhibition, which it is hoped will excel others previously given. To those who are unable to attend the great Centennial exposition this fair will be an excellent substitute, and will, no doubt, be appreciated as such by our citizens.

The fair will open on the 8th of August, and continue for not less than 30 days, nor more than 35 days. The number of exhibitors will be larger than usual, and many new features are to be introduced. Among other things a special effort will be made to make the music of the next fair a prominent feature, and it is suggested by the Committee on Music that more than one band be employed for this purpose. The Committee on Location have been instructed to prepare a plan of the floor with the proposed changes. The Committee on Decorations have under advisement a plan to increase the number of fountains by putting two at each end of the building. They intend also to enlarge the space around the central fountain, and place within the railing a number of flowers and shrubs.

At a meeting of the Board of Managers this week, the chairman of the Committee on Power and Machinery reported that the Fulton foundry was constructing for the exhibition a very powerful and highly finished engine to drive the machinery at the fair. The Union foundry and other foundries were also engaged in preparing special machinery for exhibition. He also reported that there were at this time a large excess of applications for space over that of the last fair, and that there is every certainty of having a full representation of the industries of the State and productions of its soil at the coming exhibition.

The President, Vice-President and Treasurer were appointed a committee to confer with the Art Association in regard to the Art department of the fair.

The gardener reported that the garden was in excellent condition. He recommended that the Horticultural Committee confer with the various florists and fruit growers, with a view of obtaining a full display of the fruit and flowers, which on motion was passed.

The Superintendent reported that the Wine Growers' Association propose to exhibit largely at the next fair.

The Building Committee was instructed to submit a specification of work for removing the seats and for alterations on the building necessary to be made, and submit it to the next meeting of the Board.

The President announced the following committees to take charge of the affairs of the forthcoming exhibition: Auditing—Hayes, Spaulding, Browning. Building—Drury, Wells, Smith. Circulars and Classification—Browning, Spaulding, Stoutenborough. Printing and Advertising—Spaulding, Cornwall, Patrick. Power and Machinery—Smith, Spiers, Elliot. Rules and Regulations—Patrick, Davis, Elliot. Tickets and Admission—Wells, Stetson, Cornwall. Music and Decorations—Davis, Smith, Stoutenborough. Privileges—Cornwall, Stetson, Wells. Location—Spiers, Drury, Hayes. Police—Stetson, Hayes, Patrick. Horticultural Garden—Stoutenborough, Davis, Drury. Gas and Water—Elliot, Spiers, Browning.

We propose, as usual, to give in the Press full reports of such matters as are of interest to our special classes of readers.

How Valuable Mines Should be Recognized, Prospected and Worked.

[For the Press by E. G. G.—No. 4.]

About the places where gold is generally found, we have remarked that it appears mainly in ledges of whatever nature they may be, but in country rock of primary period, such as syenite, slate, gneiss, etc., also in debris and the gravel of river beds.

It is estimated that the yearly production of gold in the world amounts to 400,000 pounds.

2. Silver Ores.

The varieties of silver ores are manifold; we will, though, for the sake of shortness, only consider the nine most prominent ones, which may, even by the uninitiated in mineralogy, be readily recognized.

A. Native Silver.

Color, metallic white; shows sometimes yellowish or grayish. Specific gravity 10.4. Dissolves readily in nitric acid and the solution containing nitrate of silver, if put on to the skin, causes a black mark. It generally contains traces of copper, iron, gold, etc.

B. Argeitile.

Color, dark leadish; scratch shining. It can be cut like lead, smelted with soda and is easily dissolved in concentrated nitric acid, sulphur precipitating. Composition: silver 87.1, sulphur 12.9. Specific gravity 7. It has the appearance of smelted lead or as though it was eaten out by constant action of an acid; sometimes it is found wiry.

C. Stephanite.

Color, iron black or lead gray. Specific gravity 6.3. It is easily dissolved in nitric acid. Caustic potassa takes up sulphide of antimony which, when the solution is neutralized, drops in brown flakes. Composition: silver 71.01, sulphur 15.80, antimony 13.19.

10. Proustite (Light Ruby Silver).

Color, cochineal to carmesine red, like a ruby. Specific gravity 5.5. If boiled for some time in solution of caustic potassa, sulphide of arsenic is extracted, which, upon hydrochloric acid being added, precipitates in yellow flakes.

E. Pyrargyrite (Dark Ruby Silver).

Color, carmesine red to dark lead gray; on the edges transparent; scratch carmesine red. Specific gravity 5.8. If treated with caustic potassa, sulphide of antimony is extracted; hydrochloric acid being added precipitates in brown flakes.

F. Kerargyrite (Horn Silver, Chloride of Silver).

Color, greasy, shining pearl gray, grayish white. Can be scratched by the finger nail, leaving a shining mark. Specific gravity 5.5. If melted on charcoal in the oxide of copper it imparts to the flame a fine blue color. Composition: silver 75.25, chlorine 24.75.

The Sutro Tunnel Decision.

The history of the Sutro tunnel, and the nature of the claim of the tunnel company against the mining companies whose claims are located upon the Comstock lode, are tolerably familiar to most of the people of this coast who are interested in the Nevada mines. According to the terms of the original agreement with Adolph Sutro, he was to receive a royalty of two dollars per ton for all the ore extracted from the mines on that lode after the completion of the tunnel. A recent decision of the U. S. Land Office was adverse to the tunnel company, and now Judge Dwinelle, of the 15th district court, has rendered a decision upon a demurrer to the complaint in the case of the Crown Point company against the Sutro tunnel company. The demurrer was overruled. One of the conditions upon which the payment of this royalty was predicated was that the tunnel should be completed within eight years from the signing of the contract. The stipulated time elapsed and the tunnel was not finished. The Crown Point company, considering Sutro's claim as a cloud upon the title of the mine, brought suit for the purpose of finally settling any question that might arise out of the old contract.

The decision is quite lengthy and covers considerable ground. The concluding paragraph, which is as follows, takes the ground that the Sutro contract is a lien:

"That this court has jurisdiction in a proper case to declare a deed or an agreement a cloud upon the title to real property is fully established by the above authorities. That the agreement set forth in the complaint is an instrument which, if *functus officio*, casts a cloud upon the title of the plaintiff's mine, will not be disputed. The agreement is in effect a mortgage on its face. It is a specific lien in equity, and such liens are by courts of equity treated and considered as mortgages. Daggett vs. Rankin, 32 Cal. 321."

"It has been recorded in the proper court as a lien. If still in force, after default, it could be foreclosed as such. The allegations of the complaint, taken as true, show the agreement has ceased to be obligatory upon the plaintiff, and that it is a cloud upon the plaintiff's title to its mine, and that it should be surrendered and canceled."

Notices of Recent Patents.

Among the patents recently obtained through Dewey & Co.'s Scientific Press American and Foreign Patent Agency the following are worthy of mention:

DRILL SOCKET.—Charles Allison, S. F. This invention relates to an improved socket head for holding drills and other tools which are subjected to a twisting strain under pressure. The inventor provides a tool holder in which a cylindrical tool shank can be securely held, thus enabling him to form a tool point on the end of a piece of rod steel and use it as a drill or other similar tool without altering the form of its shank. This tool holder will hold cylindrical shanks against torsion and thus save much time and labor in forming the shanks of drills to adapt them to be held with the requisite tenacity.

LUBRICATOR.—James M. McDonald, S. F. This invention relates to certain improvements in the construction and application of that class of devices for supplying a lubricant to the journals of railway axles, in which the lubricant is raised through a wick by capillary attraction and supplied to a pad of absorbent material, said pad being supported by a spring in such a manner that the saturated absorbent material will be kept in contact with the journal for the purpose of supplying it with a uniform quantity of oil. These lubricating devices consist essentially of a pad composed of an absorbent material, a pad holder for supporting the pad and holder and a wick for supplying oil to the pad. A number of patents have been issued on the various methods of arranging and adapting these parts in order to produce a successful lubricating device, prominent among which are the patents issued to Ernest Von Jeison at various dates in the year 1870, and while these patented devices combine the elements of success, the manner of their combination and application has not been such as to render them sufficiently complete for continued practical use. By Mr. McDonald's construction of the lubricating device he adapts every part in an easily constructed and economical manner, and so as to avoid the difficulties heretofore encountered with this class of lubricators.

HARROW.—Ezra M. Stevens, Santa Rosa, Sonoma county, Cal. The inventor calls this the Athletic harrow on account of its great flexibility and the ease with which it can be managed in order to clear it from the accumulations of weeds and avoid obstructions while it is working, and the facility with which it can be raised clear of the ground when being moved from field to field. This harrow is flexible in every direction. The driver can, without leaving his seat, lift any portion, so as to clear it from weeds, or he can raise the entire harrow so that the wheels alone will bear, and thus permit it to be drawn along a road. The entire harrow arrangement is quite effective and simple and can be handled with great ease. It can be converted into a simple harrow by removing a portion of it and attaching the remainder together. The trucks and seat can easily be removed, so as to convert it into a walking harrow, and in packing it for transportation it can be taken entirely to pieces and packed into small compass.

IMPROVEMENT IN PLOWS.—G. J. Overshiner, San Jose. Various devices have hitherto been employed to secure the share to the mold board of plows in such a manner as to allow it to be removed; among others the use of dovetailed tongue and slots, either made in a line with the joint, or in some cases transversely to it. These are open to the objection that they have easily become rusted or otherwise rendered immovable by the warping and changing of shape in the share when sharpened by hammering it, so that the points will no longer fit. In this invention Mr. Overshiner fits the share to the mold board with a plain joint, and provides two lugs upon the share which fit into shallow recesses provided for them upon the back of the mold board and between it and the land-side, and these, with an upward projecting lug or point upon the share, serve to hold the parts in place, while the single hook-bolt draws all the parts firmly together. By this means adjustable or removable plow shares are secured to the mold board so that they can be easily removed for the purpose of sharpening.

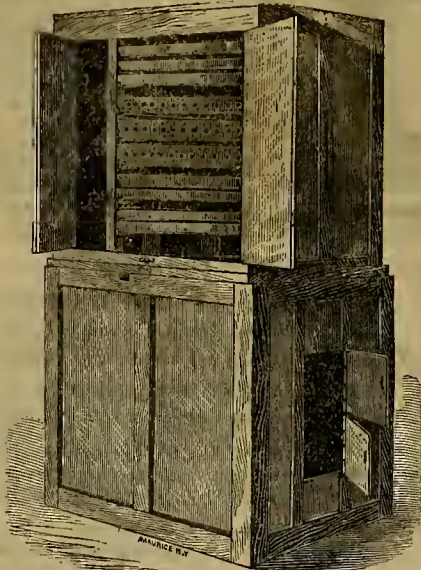
SUSPENSER BELT FOR FEMALES.—Edwin J. Fraser, S. F. This invention relates to an improved hip belt or band for supporting stockings, suspenders and other appendages from the waist of females, the object being to so construct the belt or band that it will conform to the shape of that portion of the body upon which it is supported, so that the strain or pull upon it will be received upon and over the hips instead of dragging upon the waist in the manner of the ordinary waistband. Dr. Fraser calls his invention a "conformation waist band."

SCREW PLATE.—J. S. Campbell, Astoria, and Thomas T. Eyre, Salem, Oregon. The object of the invention is to so arrange and apply the dies in a screw plate that they can be set to cut threads of any desired size, and so that when the dies are once set they will cut a screw of uniform size so that the same nut will fit every screw made by it.

McCall's Road Grader, Ditch and Levee Machine.

We give on this page an engraving of a machine which has come into wide favor because of its useful and effective work. It has been proved in all its lines of work. As a machine for road making it is worthy of consideration from the fact that the supervisors of five counties, Santa Clara, San Mateo, San Benito, Monterey and Santa Cruz, have purchased it for road work in their counties after full examination of its merits. As an instance of its road making, Moses Davis of the Davis & Chapman tract, states that he graded five miles of streets in 11½ days with 10 horses and two men, without plowing. It was in the month of August in dry, hard adobe. In ditch and levee making it has been used on Roberto's island, near Stockton, by Mr. J. P. Whitney and pronounced most successful. On railroad work Messrs. Turtin & Knox, of Sacramento, state that the machine is equal to 90 men with shovels or 40 horses and 26 men with hand scrapers. We present this evidence to show the character of the machine.

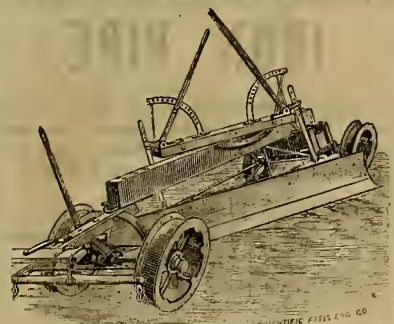
In addition to the above we would mention that Mr. McCall's apparatus took three premiums at the last State fair, one in each branch of its work, viz: one as an open ditch plow, one as a ditch and levee machine and one as a farm and road scraper. A contest before a committee of supervisors and citizens at



FAULKNER'S EXCELSIOR FAMILY FRUIT DRIER.

Stockton last year resulted in Mr. McCall's favor.

This machine, as shown by the engraving, consists of one main beam, supported by four strong iron flanged wheels, with peculiar and ingeniously contrived axletrees, which, by means of a ratchet lever, are adjusted so as to set the wheels bracing and tipped to any desired pitch, either to the right or left, thereby counteracting all side pressure. The mold board or blade is all made of steel, 17 inches wide and 10 feet long, including a shear like that of a plow, deeply concaved. This blade is supported under the main beam, and attached by connecting rods and levers to a turn table on top of the beam, so as to be lowered or raised at will, or turned at any desired angle,



McCALL'S ROAD GRADER.

throwing a furrow either to the right or left, or square with line of travel.

For grading uneven land, cutting off the high places and depositing its load in the low, the center of the blade is pivoted on a V shaped push bar, the wide ends of which are strongly hinged to a false bolster, or cross timber, near and just in front of the hind axle. This main push bar holds the blade from being moved sideways by any pressure of earth against it, but allows it to raise or lower, as desired. The turn-table on top of the beam turns always with, and at the same angles of the blade, and forms a platform on which the operator stands to regulate the working of the machine. It may be worked with four horses, and as many as 20 have been used, but usually 10 or 12 horses are employed. Information concerning the machine may be obtained by addressing the McCall road grader, ditch and levee machine company, at San Jose, Cal.

Faulkner's Excelsior Family Fruit Drier.

We take pleasure in calling the attention of our readers this week to another candidate for public favor: Faulkner's Excelsior portable family fruit drier. The public have long called for a low priced economical fruit drier, one with which the fruit grower can save their surplus fruit and convert it into money or its equivalent, trade at the store. The Excelsior drier, it is claimed, will turn out goods equal in quality to any other drier.

The Faulkner family drier has one great advantage in being very low priced: \$65 to \$75, with more drying surface than some others costing much more. It is plain and durable in its construction and very simple in its management. By watching the thermometer in the front part they can regulate the heat accurately by closing the lower registers and shutting off the heat, or opening the top ones let the heat escape. By use of the reserve hot air chamber the heat can be forced into any part of the drying chamber requiring it, thus drying the fruit equally in all parts of the chamber. By this arrangement one of the main objections to fruit driers where the trays are one above the other is overcome. By the use of the reversible trays the fruit can be turned in a moment without handling it. The reserve hot air chamber

and reversible trays are advantages possessed by no other drier.

The Excelsior drier is made portable, being mounted on rollers, and is easily moved from place to place. It can be run in the house or out of doors. It can be used in connection with the ordinary cook-stove or any small stove. When not in use can be used as a safe for provisions, or as a refrigerator. It is made very compact, the lower part holding the upper part when you wish to store it away. Mr. Faulkner had his drier in operation in Auburn, Placer county, during the winter of 1874-5. It received the approval of the principal fruit growers and residents there. The sale of the drier is in the hands of the leading houses in their lines in many of the cities East. It is manufactured for the Eastern States by Messrs. Jes. L. Lockwood & Co., Stamford, Conn., and by Mr. E. T. Steen, 236 to 232 Beale street, San Francisco, for California, etc. County rights and information of all kinds concerning the drier can be had of the inventor, J. W. Faulkner, 31 Beale street, S. F.

VOLATILIZED GOLD.—At the last meeting of the San Francisco microscopical society, Geo. Hewston donated a slide mounted with volatilized gold, which under a two-third objective, opaque, was not only a beautiful but instructive object. The microscopic globules were perfect in shape, and were obtained at some distance from the melting pot, from which they had been thrown off by the draft and heat in a volatile form, so to speak, and condensed in the air in the form of minute shot, forming a veritable shower of golden rain. With all the care and appliances for the prevention of waste in smelting or refining gold, a portion is lost in this way, and no doubt the roofs of the houses adjacent to smelters and refineries would yield enough of the precious metal to show the color, at least, under the microscope.

The Tribune Washington correspondent draws a startling picture of what may be the result if the appropriation bills are not finally passed by both houses in less than ten days. The features are that our Ministers and Consuls abroad will be recalled, the army annihilated, and the postal service stopped.

GEM AND PRECIOUS STONES.—Mr. Hanke's continued article on this subject is unavoidably deferred this week, but will appear in the next issue.

The usual clean-up of 400 ounces of gold amalgam was made at the Eureka mine, Grass valley, last week.

A Weekly List of U. S. Patents Issued to Pacific Coast Inventors.

FROM OFFICIAL REPORT FOR THE MINING AND TITVIO PRESS, DEWEY & CO., PUBLISHERS, SOLE U. S. AND FOREIGN PATENT AGENTS, 117

FOR WEEK ENDING JUNE 6TH, 1876.

DUST TRAPS FOR SMELTING FURNACES.—Th. Jefferson Taylor, Eureka, Nev.
DALL SOCKETS.—Charles Allison, S. F., Cal.
FLOUR BOLTS.—John H. De Forcs, Henry H. Hurd and George Simpson, Redwood, Cal.
SUSPENSER BELTS.—Edwin J. Fraser, S. F.
PANTALOONS.—R. Donald Gibbons, S. F., Cal.
AUGER HANDLES.—George L. Gibson, Reno.
ORE CONCENTRATOR.—Geo. Gion, Belmont, Nev.
MANUFACTURE OF RAWHIDE.—August C. Krueger, S. F., Cal.
PACKING THRESHING MACHINES FOR TRANSPORTATION.—Michel Lautenbourg, S. F., Cal.
MANUFACTURE OF ARTIFICIAL STONE.—Llewellyn L. Leathers & Felix Chappellet, Oakland, Cal.
PROCESSES AND MOLDS FOR MANUFACTURE OF ARTIFICIAL STONE IN IMITATION OF MARBLE.—Llewellyn L. Leathers & Felix Chappellet, Oakland, Cal.
PRINTING PRESSES.—Albert E. Redetoe, Oakland, Cal.
SEALING CANS.—Juan A. Robinson, S. F., Cal.
CONCRETE PAVEMENTS.—John Morris Saook, S. F., Cal.
HARROWS.—Ezra M. Stevens, Santa Rosa.
STEP LAUNERS.—Edward A. Stockton, S. F.
WINDMILLS.—Jesse Swinnerton and William C. Swinnerton, Oakland, Cal.
PLASTERING LATHS.—Theophilus A. Scheller, Marysville, Cal.
WELLS.—Samuel W. Belles, Orica, Cal.
SCREW CUTTING DIES.—John S. Campbell and Thomas J. Eyre, Salem, Oreg.
WATER ELEVATORS.—Robert H. Douglas, Fort Colville, Washington Terr.
POCKETS FOR WEARING APPAREL.—Redmond Gibbons, S. F., Cal.
SEWING MACHINE SHUTTLES.—Joseph J. Graft, S. F., ass't. one-half interest to Crie H. Jewell and Andrew Showers, of same place.
HARROWS.—John E. Perkinson, Santa Rosa.
BALING PRESSES.—Jacob Price, San Leandro.

TRADEMARK.

MEDICAL COMPOUND.—Clarke & Co. S. F.
EXPLOSIVE COMPOUND.—Charles De Laoy, S. F.

FOR WEEK ENDING JUNE 13TH, 1876.

STRAW FEEDERS FOR FURNACES.—Frank H. Fischer, S. F., Cal.
ORE SCOURERS AND AMALGAMATORS.—William H. Patton, Oakland, Cal.
HOSE PIPE COUPLINGS.—Thomas Loftis, Sacramento, Cal.
REFRIGERATING CANS.—John G. Gimmy, Moraticello, Cal.
HOBSE HAY FORKS.—Eli T. Stoughton, S. F.
SPYING INSTRUMENTS.—Joseph L. Turner, Plainsburg, Cal.

General News Items.

BRISTOW'S resignation has been formally accepted.

A \$40,000 fire occurred in Virginia City on the 19th inst.

SENATOR MORRILL will leave his place in the Senate to take charge of the Treasury Department on the 1st of July.

REPORTS of enthusiastic Hayes and Wheeler ratification meetings come from various quarters.

THE President has nominated James A. Williamson of Indiana to be Commissioner of the General Land Office.

THE Bay sugar refinery, in this city, was destroyed by fire on Monday night. Loss, \$400,000. The refinery will be immediately rebuilt.

SAMPSON, the North Adame (Mase.) shoe manufacturer who has employed Chinese for the past few years, has decided to discharge them and substitute white workmen.

A DISPATCH from Berlin says that one captain and six lieutenants of the Chinese army have arrived there, accredited by China, and bearing a request to be allowed to serve in the Prussian army for the purpose of studying the German military system. The request was granted.

THE Sheffield Telegram says: A further reduction of 12½ per cent. in miners' wages in the West Riding of Yorkshire is about to be made, and it is thought it will be accepted by the men. The secretary of the miners' union has written to all the miners' lodges that "we are on the eve of a terrible crisis, and that there must not be a strike, but terms must be made somehow." He assures them that if a strike is begun there is every possibility of its failing, with the possibility of having to submit to still greater reduction.

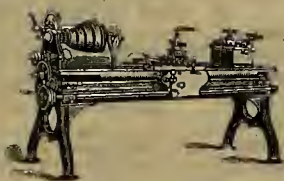
THE Bank of Nevada County, at Nevada City, has encumbered. Some three or four months since its doors were closed, and the usual clamor among creditors was indulged in. The managers felt confident that the institution would be in a condition to resume, and the excitement was for a time allayed. The 16th of the present month was named as the day upon which the doors of the bank would be thrown open. The President has published a card stating that it will be impossible for the concern to resume, and that an assignment in full of the effects has been made to a responsible party for the benefit of the creditors.



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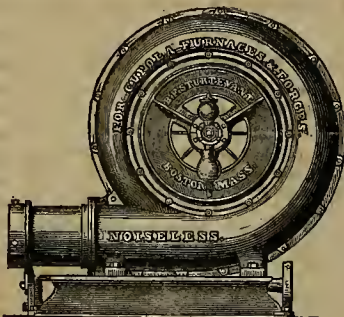
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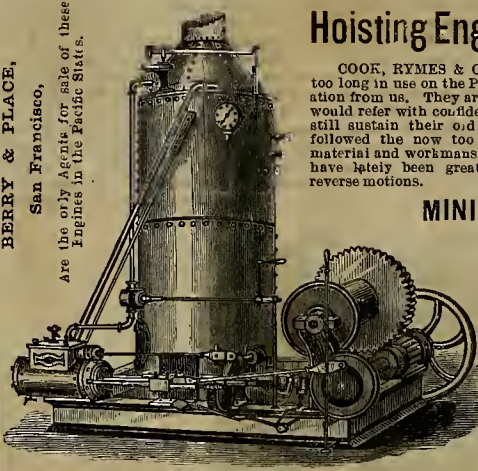
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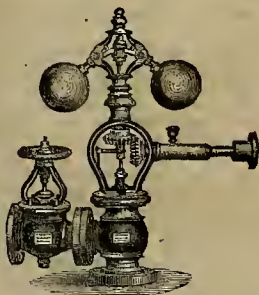
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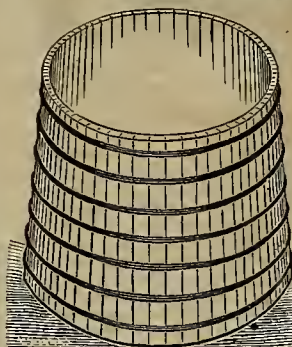
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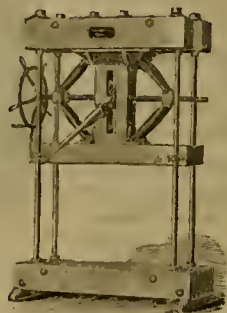
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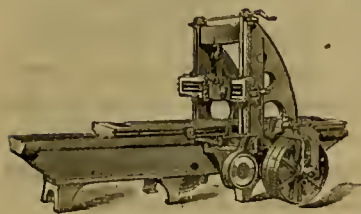
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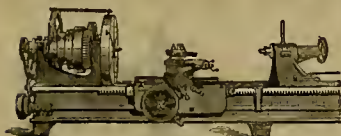
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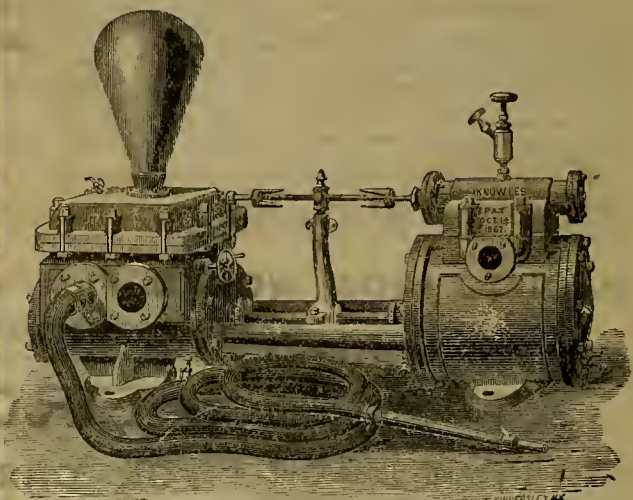
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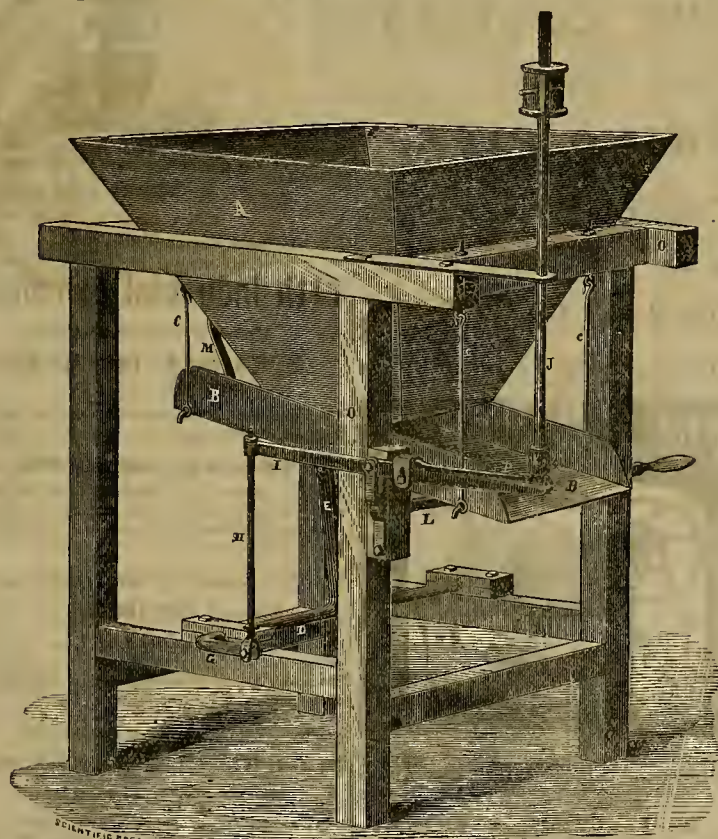


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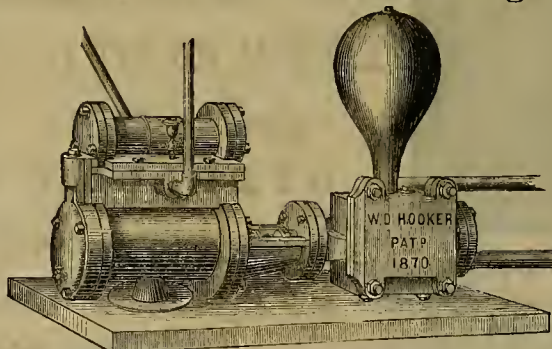
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Allen's Patent Governor Valve is constructed with a double disc in a tubular frame, and is perfectly balanced, there being no spindle as in the ordinary throttle valve to interfere with its equilibrium. The valve is moved by means of a lever, and is opened and closed by a rocking motion of a steel spindle, which is covered with brass, insuring the greatest possible durability.

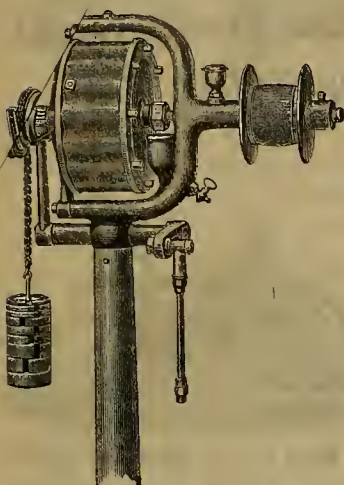


Fig. 1. For Variable Cut-Off Engine

possible boiler pressure at each stroke of the piston, has produced astonishing results by being attached to old engines, greatly increasing their power or effecting a direct saving of fuel, and in hundreds of instances doing both. In running an engine with the Allen Governor with high or low pressure of steam and with all variations of power, the throttle is opened wide in the morning and remains so until closed at night, thus relieving the engineer from all labor and care except keeping the engine oiled, and giving him a great deal of time for other duties.

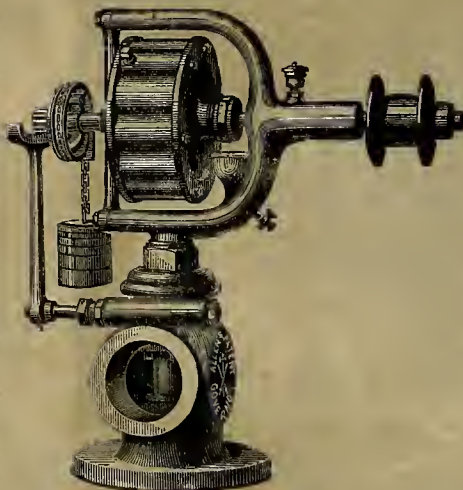


Fig. 2. Allen Governor and Valve.

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Fig. 3. Section of Allen Governor.

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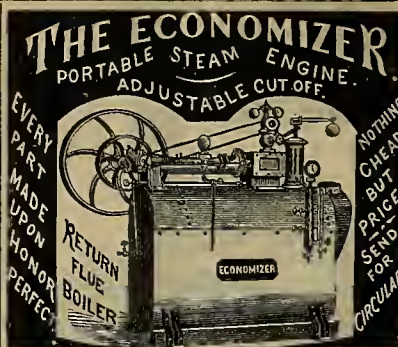


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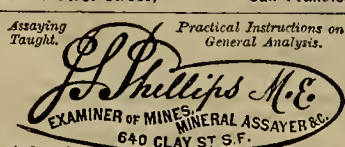
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The Exhibition will continue at least one month. There will be no charge for exhibiting space.

Application for space or for information should be addressed to the Secretary of the Board of Managers, Eleventh Exhibition, 37 Post St., San Francisco, or to J. H. Gilmore, Supt., at same address.

A. S. HALLIDIE, Pres't.

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No bills will be paid by the Managers unless ordered by the proper committees.

Continued from Page 407.

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Rathborne, R. Wm.	159	100	100 00
Rathborne, R. Wm.	160	100	100 00
Rathborne, R. Wm.	161	100	100 00
Rathborne, R. Wm.	162	100	100 00
Rathborne, R. Wm.	163	100	100 00
Rathborne, R. Wm.	164	100	100 00
Rathborne, R. Wm.	165	100	100 00
Rathborne, R. Wm.	166	100	100 00
Rathborne, R. Wm.	167	100	100 00
Rathborne, R. Wm.	168	100	100 00
Rathborne, R. Wm.	169	100	100 00
Rathborne, R. Wm.	170	100	100 00
Rathborne, R. Wm.	171	100	100 00
Rathborne, R. Wm.	172	100	100 00
Rathborne, R. Wm.	173	100	100 00
Rathborne, R. Wm.	174	100	100 00
Rathborne, R. Wm.	175	100	100 00
Rathborne, R. Wm.	176	100	100 00
Rathborne, R. Wm.	177	100	100 00
Rathborne, R. Wm.	178	75	75 00
Rathborne, R. Wm.	179	100	100 00
Rathborne, R. Wm.	180	100	100 00
Rathborne, R. Wm.	181	100	100 00
Rathborne, R. Wm.	182	100	100 00
Rathborne, R. Wm.	183	100	100 00
Rathborne, R. Wm.	184	100	100 00
Rathborne, R. Wm.	185	100	100 00
Rathborne, R. Wm.	186	100	100 00
Rathborne, R. Wm.	187	100	100 00
Rathborne, R. Wm.	188	100	100 00
Rathborne, R. Wm.	189	100	100 00
Rathborne, R. Wm.	190	100	100 00
Rathborne, R. Wm.	191	100	100 00
Rathborne, R. Wm.	192	100	100 00
Rathborne, R. Wm.	193	100	100 00
Rathborne, R. Wm.	194	100	100 00
Rathborne, R. Wm.	195	100	100 00
Rathborne, R. Wm.	196	100	100 00
Rathborne, R. Wm.	197	100	100 00
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Rathborne, R. Wm.	209	100	100 00
Rathborne, R. Wm.	210	100	100 00
Rathborne, R. Wm.	211	100	100 00
Rathborne, R. Wm.	212	100	100 00
Rathborne, R. Wm.	213	100	100 00
Rathborne, R. Wm.	214	100	100 00
Rathborne, R. Wm.	215	100	100 00
Rathborne, R. Wm.	216	100	100 00
Rathborne, R. Wm.	217	100	100 00
Rathborne, R. Wm.	218	100	100 00
Rathborne, R. Wm.	219	100	100 00
Rathborne, R. Wm.	220	100	100 00
Rathborne, R. Wm.	221	100	100 00
Rathborne, R. Wm.	222	100	100 00
Rathborne, R. Wm.	223	100	100 00
Rathborne, R. Wm.	224	100	100 00
Rathborne, R. Wm.	225	100	100 00
Rathborne, R. Wm.	226	47	47 00
Rathborne, R. Wm.	227	100	100 00
Rathborne, R. Wm.	228	100	100 00
Rathborne, R. Wm.	229	100	100 00
Rathborne, R. Wm.	230	100	100 00
Rathborne, R. Wm.	231	100	100 00
Rathborne, R. Wm.	232	100	100 00
Rathborne, R. Wm.	233	100	100 00
Rathborne, R. Wm.	234	100	100 00
Rathborne, R. Wm.	235	100	100 00
Rathborne, R. Wm.	236	100	100 00
Rathborne, R. Wm.	237	100	100 00
Rathborne, R. Wm.	238	100	100 00
Rathborne, R. Wm.	239	100	100 00
Rathborne, R. Wm.	240	100	100 00
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Rathborne, R. Wm.	247	100	100 00
Rathborne, R. Wm.	248	100	100 00
Rathborne, R. Wm.	249	100	100 00
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Rathborne, R. Wm.	254	100	100 00
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Rathborne, R. Wm.	264	100	100 00
Rathborne, R. Wm.	265	100	100 00
Rathborne, R. Wm.	266	100	100 00
Rathborne, R. Wm.	267	100	100 00
Rathborne, R. Wm.	268	100	100 00
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Rathborne, R. Wm.	286	100	100 00
Rathborne, R. Wm.	287	100	100 00
Rathborne, R. Wm.	288	100	100 00
Rathborne, R. Wm.	289	100	100 00
Rathborne, R. Wm.	290	100	100 00
Rathborne, R. Wm.	291	100	100 00
Rathborne, R. Wm.	292	100	100 00
Rathborne, R. Wm.	293	100	100 00
Rathborne, R. Wm.	294	100	100 00
Rathborne, R. Wm.	295	100	100 00
Rathborne, R. Wm.	296	100	100 00
Rathborne, R. Wm.	297	100	100 00
Rathborne, R. Wm.	298	100	100 00
Rathborne, R. Wm.	299	100	100 00
Rathborne, R. Wm.	300	100	100 00

Names.	No. Certificate.	No. Shares.	Amount.
Smith, H. L.	285	100	100 00
Smith, H. L.	286	100	100 00
Taylor, James M.	287	50	50 00
Thompson, P. H.	288	100	100 00
Taylor & Cooper	289	270	270 00
Task & Stone	290	800	800 00
Tawar & Leaned	291	300	300 00
Taylor & Co, W. B.	292	50	50 00
Taylor & Co, W. B.	293	29	29 00
Taylor & Co, W. B.	294	100	100 00
Taylor & Co, W. B.	295	100	100 00
Taylor & Co, W. B.	296	100	100 00
Union National Bank of N. Y.	297	100	100 00
Yell, Fred.	298	29	29 00
Van Schalk & Co.	299	147	147 00
Weed, Edward R.	300	135	135 00
White, A. M.	301	162	162 00
Wollberg & Co.	302	100	100 00
Woodman, Cyrus	303	306	306 00
Wetson, Augustus E.	304	300	300 00
Well, Henry	305	100	100 00
Well, Henry	306	100	100 00
Well, Henry	307	100	100 00
Well, Henry	308	100	100 00
Well, Henry	309	100	100 00
Well, Henry	310	100	100 00
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Well, Henry	392	100	100 00
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Well, Henry	396	100	100 00
Well, Henry	397	100	100 00
Well, Henry	398	100	100 00
Well, Henry	399	100	100 00
Well, Henry	400	100	100 00

In United States gold and silver coin, to the Secretary at his office, 60 Montgomery street, San Francisco, Cal.

Any stock upon which this assessment shall remain unpaid on the twenty-first day of June, 1876, will be delinquent, and advertised for sale at public auction, and unless payment is made before, will be sold on Thursday, the sixth day of July, 1876, to pay the delinquent assessment, together with costs of advertising and expenses of sale.

SAMUEL S. MURPHY, Secretary.

Office, 60 Montgomery street, San Francisco, Cal.

Umpire Tunnel and Mining Company of Utah.

At a Directors' meeting of above company, held on the 16th inst., it was resolved that a meeting of stockholders of the company be convened on Monday, June 19th, 1876, at the office of the company, 635 California street, to decide upon a proposition to increase the capital stock of the company from three hundred thousand (\$300,000) dollars, divided into thirty thousand (30,000) shares of ten (10) dollars each, to seven hundred and fifty thousand (\$750,000) dollars, divided into seventy-five thousand (75,000) shares of ten (10) dollars each.

(Signed) R. R. HARRIS, W. W. DAVIS, T. E. HUGHES, E. McPHERTRIDGE

Iron and Machine Works.

WM. HAWKINS & CANTRELL,
MACHINE WORKS,

210 & 212 Beale St.,

near Howard, - - - SAN FRANCISCO.

Steam Engines and all kinds of Mill and Mining Machinery.

Also manufacture and keep constantly on hand a supply of iron.

Improved Portable Hoisting Engines,

From Ten (10) to Forty (40) Horse Power.

N. B.—Johning and Repairing done with Dispatch.

FULTON

Foundry and Iron Works.

HINCKLEY & CO.,

MANUFACTURERS OF

STEAM ENGINES,

Quartz, Flour and Saw Mills,

Hayes Improved Steam Pump, Brodie's Improved Crusher, Mining Pumps, Amalgamators, and all kinds of Machinery.

N. E. corner of Tehama and Fremont streets, above Howard, San Francisco.

THE RISDON

Iron and Locomotive Works,

INCORPORATED.....APRIL 30, 1863.
CAPITAL.....\$1,000,000.

LOCATION OF WORKS:

Corner of Beale and Howard Streets,
SAN FRANCISCO.

Manufacturers of Steam Engines, Quartz and Flour Mill Machinery, Steam Boilers (Marine, Locomotive and Stationary), Marine Engines (High and Low Pressure), All kinds of light and heavy Castings at lowest prices. Ovens and Tappets, with chilled faces, guaranteed 40 per cent. more durable than ordinary iron.

Directors:

Joseph Moors, Jesse Holladay, O. E. McLane,
Wm. Norris, Wm. H. Taylor, J. B. Haggin,
James D. Walker.

WM. H. TAYLOR.....President
JOSEPH MOORE.....Vice-President and Superintendent
LEWIS R. MEAD.....Secretary

THOS. PENDERGAST. HENRY S. SMITH.

ÆTNA IRON WORKS.

MANUFACTURERS OF

IRON CASTINGS

and MACHINERY,

OF ALL KINDS.

Fremont Street, bet. Howard and Folsom.

SAN FRANCISCO.

SHEET IRON PIPE.

THE

Risdon Iron and Locomotive Works

Corner Howard and Beale Streets,

Are prepared to make SHEET IRON AND ASPHALTUM PIPE, of any size and for any pressure, and contract to lay the same where wanted, guaranteeing a perfect working pipe with the least amount of material.

Standard sizes of railroad Car Wheels, with special patterns for Mining Cars. These small wheels are made of the best Car Wheel Iron, properly chilled, and can be fitted up with the improved axle and box—introduced by this company, and guaranteed to outlast any other wheels made in this State.

✓ All kinds of Machinery made and repaired.

24v22-3m JOSEPH MOORE, Superintendent.

THOMPSON BROTHERS, EUREKA FOUNDRY,

Light and Heavy Castings of Every Description Manufactured.

Sole Proprietors and Manufacturers of

LYNCUS

Ventilating and Illuminating Tile,

The Only Illuminating Tile Manufactured for Lighting Cellars, Basements and Dark Rooms which provides proper ventilation for such places.

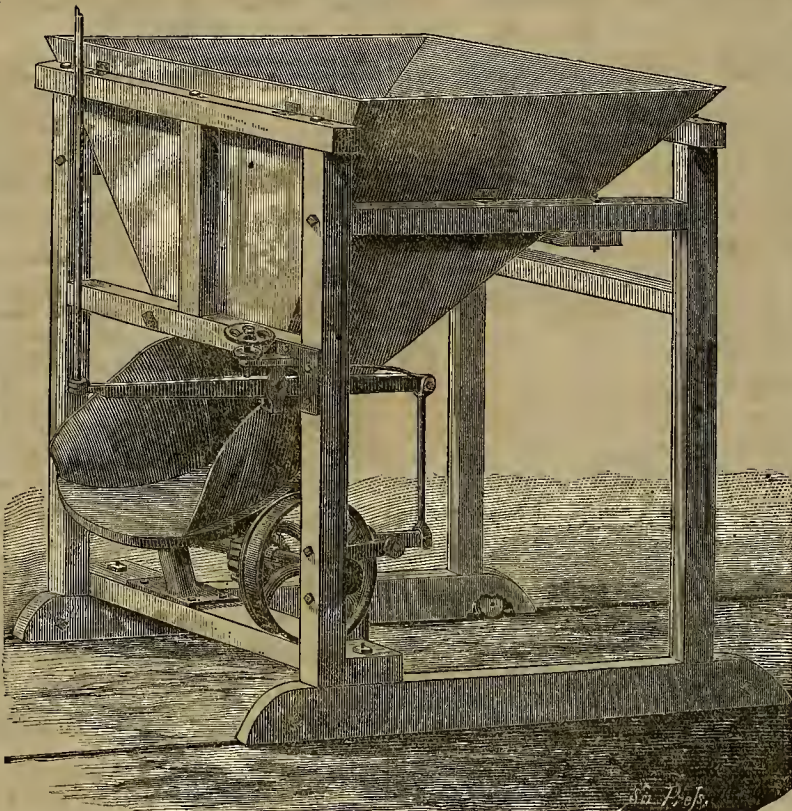
129 and 131 Beale Street,

NEAR MISSION & HOWARD, - - - SAN FRANCISCO.

HENDY & COCHRANE'S ORE FEEDER

FOR QUARTZ MILLS,

AWARDED FIRST PREMIUM AT THE TENTH INDUSTRIAL FAIR OF THE MECHANICS' INSTITUTE.



It may be considered as now fully demonstrated, by careful and long-continued experimentation, that the plan upon which a perfect ore feeder must be constructed is that of the carrier, and not that of the shaking table. Uniform and accurate feeding is not possible upon the latter plan. The ore must be evenly carried, upon a steadily advancing plane, or table, to the line of discharge, and there simply dropped. Spasmodic or jerky contrivances will not answer the purpose.

REFERENCES.

A letter received from the Julian Mill, Newcastle, says, of the Table Feeder: "It is the most perfect Feeder we have ever seen; don't see how any mill can do without them."—A letter from Mr. O. C. Belding, of Amador County, speaks in the highest terms of them. Two of the machines were shipped to the Bunker Hill Mill, Amador County. Mr. Stevenson, of Boston Mill, Gold Hill, Nevada, says they are the best Feeder he has ever seen. Mr. Lachman, of the Soulsby Mill, Tuolumne County, says they work splendidly; could not do better. Two of the machines were shipped to the California Company, Nevada City. C. J. Garland, of Mosquito Gulch, Calaveras County, says: "I find them an excellent machine." S. D. B. Stewart, Supt. Lincoln Gold Mining Company, says they are a perfect success. O. C. Hewitt, Supt. Keystone Mining Company, says: "I can safely recommend them to all millmen."

We warrant the machines to give perfect satisfaction, and to be a better and more durable Feeder than any other in the market, and will sell them as cheap as any other machine of its class.

For Description, Send for Circular to

J. HENDY, Sole Manufacturer,

No. 32 Fremont St., - - - San Francisco, Cal.,

WHERE IT CAN BE SEEN IN OPERATION.

ALSO, MANUFACTURER OF

HENDY'S IMPROVED AMALGAMATOR and CONCENTRATOR,
AND DEALER IN
QUARTZ MILL MACHINERY.

THORNE, DeHAVEN & CO.

21st Street, above Market,
PHILADELPHIA.

DRILLING MACHINES.

PORTABLE DRILLS. Driven by power in any direction, self-feed and convenient adjustment.

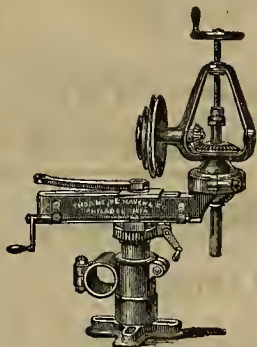
RADIAL DRILLS. Self-feed—large adjustable box table—separate base plate, every convenience.

VERTICAL DRILLS. Self-feeding—of new and improved designs.

MULTIPLE DRILLS. For boiler work, etc., 2 to 20 spindles, fed and returned by power or hand, together or separately.

HORIZONTAL BORING AND DRILLING MACHINES. For large pieces—with boring head, adjustable, vertically and horizontally.

SPECIAL DRILLS. For special work. Gun Blank Drills, Coal Drills, &c., built to order.



Brass Foundry & Pump Factory.

A. J. SMITH, Plumber,

Sole Proprietor and Manufacturer of the

Celebrated Hudson Force Pumps, Atwood & Bodwell Windmill Brass Pumps, Smith's Copper-Lined Pumps, Plumbers' Force Pumps.

✓ Special attention paid to Brewers', Distillers', Beer and Hot Liquor Pumps and Wine Pumps. Particular attention paid to AIR PUMPS, also to

DIVERS' SUBMARINE PUMPS.

Artesian Well Pumps Made to Order.

✓ Brass Castings Made to Order.

No. 222 FREMONT STREET, - - - SAN FRANCISCO

Miners' Foundry and Machine Works,

CO-OPERATIVE,

First Street, bet. Howard and Folsom, San Francisco

Machinery and Castings of all kinds.

UNION IRON WORKS, Sacramento.

ROOT, NEILSON & CO.,

MANUFACTURERS OF

STEAM ENGINES, BOILERS, CROSS' PATENT BOILER FEEDER AND SEDIMENT COLLECTOR

Junbar's Patent Self-Adjusting Steam Piston

PACKING, for new and old cylinders.

And all kinds of Mining Machinery.

Front Street, between N and O streets
SACRAMENTO CITY.

McAFEE, SPIERS & CO.,

BOILER MAKERS

AND GENERAL MACHINISTS,

Howard between Fremont and Beale St., San Francisco.

PACIFIC

Rolling Mill Company,

SAN FRANCISCO, CAL.

Established for the Manufacture of

RAILROAD AND OTHER IRON
Every Variety of Shafting,
Embracing ALL SIZES of
Steamboat Shafts, Cranks, Piston and Connecting Rods, Car and Locomotive Axles and Frames.

—ALSO—
HAMMERED IRON

Of every description and size.

✓ Orders addressed to PACIFIC ROLLING MILL COMPANY, P. O. box 2032, San Francisco, Cal., will receive prompt attention.
✓ The highest price paid for Scrap Iron.

PHELPS

Manufacturing Company,

MANUFACTURERS OF ALL KINDS OF

Wharf and Bridge Bolts, Railroad Trestle Work, Car Frames and Bolts, Machine Bolts, Set Screws and Tap Bolts, Lag or Coach Screws.

ALL STYLES OF FANCY HEAD BOLTS.

HOT AND COLD PRESSED HEXAGON AND SQUARE NUTS, WASHERS, BOLT ENDS, TURN-BUCKLES, ETC., ETC.

13, 15 & 17 Drumm St., near California,
SAN FRANCISCO, CAL.

OCCIDENTAL FOUNDRY,

137 and 139 First street, - San Francisco

STEIGER & KERR,

IRON FOUNDERS.

Quicksilver Condensers and Furnace Castings.

Sole manufacturers of the Hepburn Roller Pan and Callahan Grate Bars, suitable for Burning Screenings.

✓ Notice.—Particular attention paid to making Superior Shoes and Dies.

CALIFORNIA BRASS FOUNDRY,

No. 125 First Street, opposite Minna,
SAN FRANCISCO, CAL.

All kinds of Brass, Composition, Zinc, and Babbitt Metal Castings, Brass Ship Work of all kinds, Spikes, Sheathing Nails, Rudder Braces, Hinges, Ship and Steamboat Belts, and Gears of superior tone. All kinds of Cocks and Valves, Hydraulic Pipes and Nozzles, and Hose Couplings and Connections of all sizes and patterns, furnished with dispatch.
✓ PRICES MODERATE. ✓
J. H. WEED. V. KINGWELL.

California Machine Works,

119 BEALE STREET, SAN FRANCISCO.

BIRCH, ARGALL & CO.,

Builders of QUARTZ, SAW AND FLOUR MILLS

Keating's Sack Printing Presses,

THE ECONOMY HYDRAULIC HOIST FOR STORES,

And General Machinists. 25v23-3m

STEAM ENGINES AND BOILERS

Of all sizes—from 2 to 50-Horse power. Also, Quartz Mills, Mining Pumps, Hoisting Machinery, Shafting, Iron Tanks, etc. For sale at the lowest prices by

10v27tf J. HENDY, No. 32 Fremont Str. et.

LEVI STRAUSS & CO.,

Patent Riveted

Clothing,

14 & 16 Battery St.,
San Francisco.



These goods are specially adapted for the use of FARMERS, MECHANICS, MINERS, and WORKING MEN in general. They are manufactured of the Best Material, and in a Superior Manner. A trial will convince everybody of this fact.

Patented May 12, 1873.
USE NO OTHER, AND INQUIRE FOR THESE GOODS ONLY. scow-hp

Rupture.

Use no more Metallic Trusses. No more suffering from Iron Hoops or Steel Springs. Dr. Rowe's Patent Elastic Truss is worn with ease and comfort night and day, and will and has performed radical cures when all others have failed. Bolder, if you are ruptured, try one of Dr. Rowe's comfortable elastic appliances; you will never regret it. ROWE'S ELASTIC TRUSS CO., 609 Sacramento St., S. F. Send for Circular.

San Francisco Cordage Company.

Established 1856.

We have just added a large amount of new machinery of the latest and most improved kind, and are again prepared to fill orders for Rope of any special lengths and sizes. Constantly on hand a large stock of Manila Rope, all sizes; Tanned Manila Rope; Hay Rope; Whale Line, etc., etc.

TUBBS & CO.,

621 611 and 613 Front street, San Francisco

MINING MACHINERY DEPOT,

PARKE & LACY, 417 Market Street, S. F.

SOLE AGENTS FOR



Burleigh Air Compressors,

ROCK DRILLS and
Tunneling Machinery.

HASKINS'
ENGINES AND BOILERS,

(SEMI-PORTABLE)

1, 2, 4, 6, 8, 10 and 12 H. P.

WRIGHT'S

Bucket-Plunger Steam Pump.

COSMOPOLITAN EMERY

WHEELS AND STANDS.



Putnam Machine Company's

MACHINISTS' TOOLS and
Wood Working Machinery.

HEALDS & SISCO

Centrifugal Steam Pumps.

FARMER'S ELECTRIC MACHINE
FOR BLASTING AND HILL'S
EXPLODERS.

HASKINS' BLOWING ENGINES

For Mines.

Large Assortment of

MORSE TWIST DRILLS.



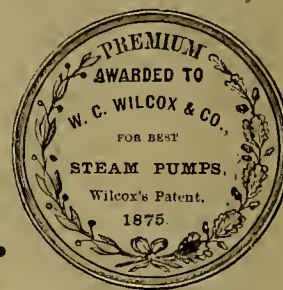
HASKINS' PORTABLE HOISTING ENGINES, constructed especially for economical use in mining districts, with Compressed Air or Steam, adapted to all classes of underground work and made throughout on the interchangeable plan, so that all parts can be duplicated when desired. Catalogues and Estimates given on application.



GOLD MEDAL

AWARDED TO

San Francisco Steam Pumps.



AFTER ONE OF THE

MOST THOROUGH TRIALS

Ever Had in the United States,

BETWEEN COMPETITORS

—OF—

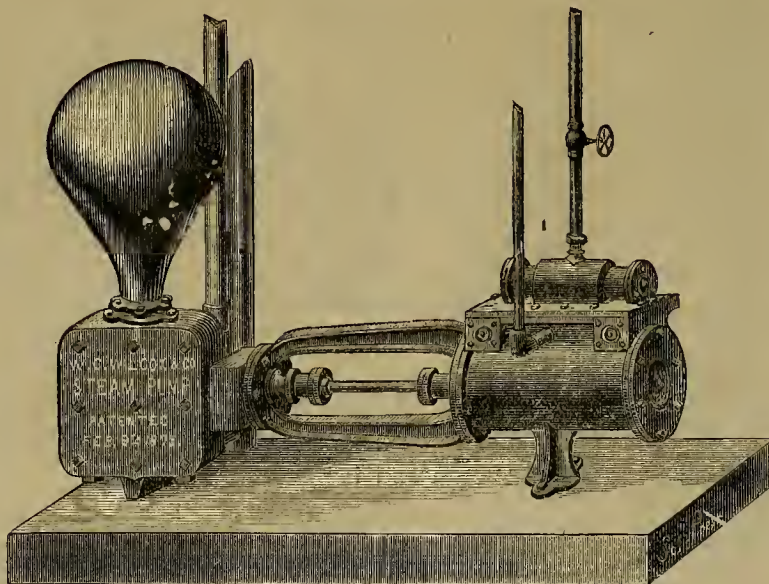
Best Established Reputation,

In which, at great expense, the different Steam Pumps were tried under every test known to experts, the Examining Committee of the Tenth Industrial Fair of the Mechanics' Institute have awarded to us their

GOLD MEDAL

—FOR—

Best Steam Pumps on Exhibition.



We are prepared to furnish PUMPS UNDER CONTRACT, guaranteeing their ability to perform any specific work for which steam pumps are adaptable, such as

RAISING WATER FROM MINES,

FOR WATER WORKS.

FEEDING BOILERS, RAISING WATER FROM WELLS; STEAMER AND SHIP PUMPS, ETC.

We would also call the attention of those interested, to our Direct Acting Deep-Well Pumps for raising water from

Any Desired Depth.

Also to our Especial Construction of Pumps FOR HANDLING QUICKSILVER or heavy liquids.

We claim that our Pumps are the best ever made in simplicity of construction, economical use of power, durability and perfect adaptability for general uses, and we ask all persons interested to investigate our title to this claim. Salesrooms at our Machine Shop, 114 and 116 BEALE STREET, SAN FRANCISCO.

W. C. WILCOX & CO., Proprietors.

PACIFIC MACHINERY DEPOT,

H. P. GREGORY & Co., Nos. 14 & 16 First Street,

San Francisco, Cal.

P. O. Box 168.

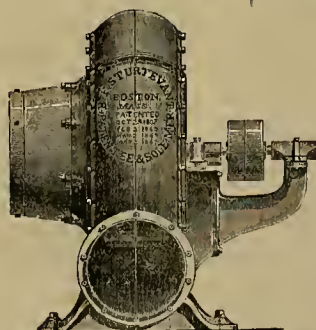
SOLE AGENT FOR THE PACIFIC
COAST FOR

J. A. Fay & Co's Wood-
working Machinery,

Blake's Patent Steam
Pumps,

Tanite Co's Emery Wheels
and Machinery,

Fitchburg Machine Co's
Machinists' Tools,



Sturtevant Exhaust Fan for Remov-
ing Shavings and Sawdust
from Machines.

Sturtevant's Blowers and
Exhaust Fans,

J. A. Roebling's Sons Wire
Rope,

Pure Oak Tanned Leather
Belting,

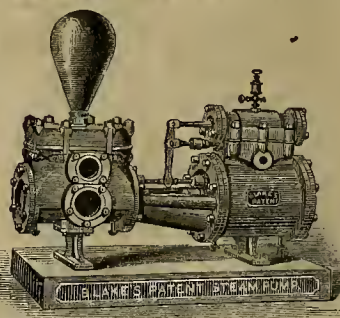
Perin's French Band Saw
Blades,

Planer Knives,

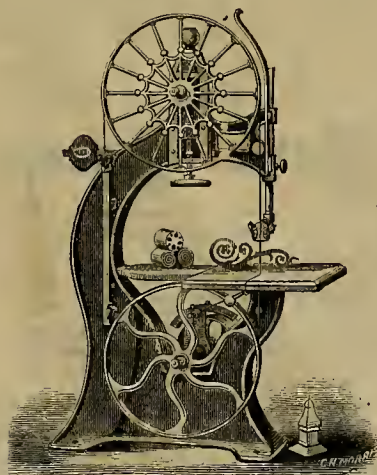
Nathan & Dreyfus' Glass
Oilers, and Mill and
Mining Supplies

of all Kinds.

BLAKE'S PATENT STEAM PUMP.



Over 8,500 in Successful Use in the United States.



From January to July, 1876.

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